UNIVERSITY of
PENNSYLVANIA
LIBRARIES

MOVING OFF THE MESA:
A TYPOLOGICAL ANALYSIS OF HOUSING
AT ACOMA PUEBLO, NEW MEXICO

Catherine deJarnette Vieth

A THESIS

in

Historic Preservation

Presented to the Faculties of the University of Pennsylvania in
Partial Fulfillment of the Requirements for the Degree of

MASTER OF SCIENCE

2001

Supervisor
David Hollenberg
Associate Regional Director
Northeast Region, National Park Service

Reader
Dennis G. Playdon
Program Manager
Cornerstones Community Partnerships

Graduate Group Chair
Frank G. Matero
Associate Professor of Architecture

OF
PENNSYLVANIA
LIBRARIES

PREFACE

This thesis could not have succeeded without the involvement of several key people and organizations. First, I must thank David Hollenberg, my advisor, for his continued guidance over the course of the past year. His insightful questions challenged me to rethink my assumptions and further focus my thesis. Dennis Playdon of Cornerstones Community Partnerships has been a wonderful resource as my reader, as well as my connection to the people and projects at Acoma. Thanks are also due the staff of Cornerstones and Ed Crocker, who taught me all about adobe construction. Of course, none of this could have happened without Tony Atkin, who sparked my interest in Acoma last year. As my advisor for the design thesis complement to this project, he has been a significant source of inspiration and encouragement throughout the whole process.

I also want to acknowledge the generous support of the Samuel H. Kress Foundation for providing me with the means to travel to Acoma Pueblo. In addition, a Sustainable Communities grant from the Environmental Protection Agency was instrumental in allowing me to conduct research in New Mexico, as well as to participate in the current sustainable housing projects at Acoma.

Finally, I would like to dedicate this thesis to the Acoma community as a whole. I particularly want to acknowledge the warm hospitality of Darin and Kim Victorino; William Sarracino; Brian Vallo, director of the newly formed Historic Preservation Office at Acoma; and the tribal government at Acoma, who all made this project possible.

TABLE OF CONTENTS

Preface		Page ii
List of Illustrations		Page iv
Chapter 1	Introduction to Typology	Page 1
Chapter 2	Introduction to Acoma	Page 8
	Historical Overview	Page 14
	Cultural Overview	Page 18
Chapter 3	Historic Pueblo Construction	
	Pre-Spanish Pueblo	Page 25
	17th and 18th Centuries	Page 28
	Late 19th century into the 20th century	Page 43
	Late 20th Century	Page 46
Chapter 4	Comparative Analysis with	
	Contemporary House Types	Page 49
Chapter 5	Recommendations for Design	Page 59
Bibliography		Page 66
Index		Page 73

LIST OF ILLUSTRATIONS

Figure 1	Map of New Mexico	Page 9
Figure 2	View of Acoma from the valley floor	Page 10
Figure 3	Historic map from HABS survey, 1934	Page 10
Figure 4	View of Mount Taylor	Page 12
Figure 5	View of Enchanted Mesa	Page 12
Figure 6	Photo of cottonwood tree	Page 13
Figure 7	Plan of Pre-Spanish Pueblo	Page 26
Figure 8	View west between house rows	Page 29
Figure 9	View north across plaza	Page 29
Figure 10	View of cacique's house	Page 34
Figure 11	Example of oldest stone construction	Page 37
Figure 12	Example of oldest adobe block	Page 37
Figure 13	Historic photo of houseblocks with long viga ends	Page 38
Figure 14	Example of carved beam in house	Page 38
Figure 15	Sketch of idealized pueblo section	Page 40
Figure 16	Example of added entrances	Page 44
Figure 17	Elevation drawing from HABS survey, 1934	Page 45
Figure 18	Section drawing from HABS survey, 1934	Page 45
Figure 19	Plan of Acoma Pueblo, 1980	Page 48
Figure 20	Examples of alterations to houses	Page 48

Figure 21 Historic photo of field houses in Acomita Page 50

Figure 22 Partial diagram of subvillage areas Page 50

Figure 23 Historic photo of houses in Acomita Page 52

Figure 24 Photo of current houses in Acomita Page 52

Figure 25 Aerial photo of Acomita Page 55

Figure 26 Example of HUD house in Sky-Line Village Page 56

Figure 27 Example of HUD house in Sky-Line Village Page 56

Chapter 1 Introduction to typology

> To raise the question of typology in architecture is to raise a question of the nature of the architectural work itself. To answer it means, for each generation, a redefinition of the essence of architecture and an explanation of all its attendant problems.[1]
>
> - Rafael Moneo

Architecture can be described in many different ways, but it is much more difficult to fully comprehend it. There are many different aspects that must be considered, from the climate where it resides to the culture it embodies. Typology has long been a way to elicit the essence of architecture, although the concept has been continuously modified since initially used during the middle of the eighteenth century. The idea of the primitive hut, proposed by Marc-Antoine Laugier, was described as "the type on which all the magnificences of architecture are elaborated."[2] Laugier, among others, looked at the roots of architecture as being the earliest and simplest constructions and therefore the pure type.

One of the most influential in defining the concept of type was Antoine Chrysostôme Quatremère de Quincy in the early nineteenth century. In his *Dictionnaire historique d'architecture*, Quatremère de Quincy described type as

> less the image of a thing to copy or imitate completely, than the idea of which must itself serve as a rule for the model.

---

[1] Rafael Moneo, "On Typology," in *Oppositions* 3 (Summer 1978), p. 23.

[2] Marc-Antoine Laugier, as quoted in Joseph Rykwert, *On Adam's House in Paradise*. (New York: Museum of Modern Art, 1972), p. 44.

> ... All is precise and given when it comes to the model, while all is more or less vague when it comes to the *type*.[3]

Type was an ideal, something not tied to the specific. One must aspire to the type, but can never achieve it completely. It is the essence of architecture, adding a metaphoric layer to the materials of construction. In a recent book about Quatremère and his theories, Samir Younés describes Quatremère's interpretation of type as

> a Platonic Form pregnant with infinite potentialities from which many dissimilar buildings may derive. ... The higher form of the type allows the understanding of essences in architecture: the realm of the true; while the form of the model becomes a means for individuating particular buildings: the realm of the real. It can be said that, in matters of imitation, the idea of the true is of an intellectual evidence, while the idea of the real depends on a sensuous evidence.[4]

By elevating the type into the intellectual realm, it can be used as a common foundation for architecture without becoming an object to be copied. The type holds a specific significance in each building, but the forms resulting from the type do not need to resemble each other. In his *Dictionnaire*, Quatremère concludes his definition of type by warning that

> two adversaries, by opposing routes, agree on distorting the whole of architecture; the first by emptying it absolutely of any imitative system and freeing it from any rule, from any constraint; the other by chaining and repressing this art within the bonds of an imitative servility that would destroy both the feeling and the spirit of imitation.

---

[3] Antoine Chrysostôme Quatremère de Quincy, as translated in Samir Younés, *The True, The Fictive, And The Real: The Historical Dictionary of Architecture of Quatremère de Quincy* (London: Andreas Papadakis Publisher, 1999), pp. 254-255.

[4] Younés, p. 22.

> We have undertaken this discussion in order to better explain the value of the word *type* in its metaphorical use in a variety of works, and the error of those who either fail to recognize it because it is not a model, or misinterpret it by imposing on it the rigour of a model that carries with it the meaning of an identical copy.[5]

The fear of type fueling cookie-cutter design is a commonly misunderstood aspect in the study of typology. When developed in the broader sense, the type can only imbue the building with more relevance, rather than removing it through mere imitation.

The work of Jean-Nicolas-Louis Durand in the early part of the nineteenth century illustrates the limitations of defining type through imitation.[6] Durand was concerned with the composition of well-defined and specified elements to create architecture. In his systematic and categorical approach, simple geometric forms were combined to produce the expected building type by following the rules of his classifications; however, along with such a clear set of rules comes a loss of the metaphorical aspects of design. The creative act of design was reduced to a recipe of geometric elements.

In the mid-twentieth century however, architects and architectural theorists began to return to Quatremère's idea of type. One of the first to reinvestigate type was Giulio Carlo Argan in his article, "Tipologia." Although he was clearly influenced by Quatremère's work, Argan added a new layer to the definition of the type. Rafael Moneo suggests that "for Argan, it was through the comparison and overlapping of certain formal regularities that the type emerged; it was the basic form through which series of

---

[5] Quatremère de Quincy, as translated in Samir Younés, p. 256.
[6] as cited in Moneo, pp. 28-31.

buildings were related to each other in a comprehensible way."[7] Type was not a series of elements to be arranged in a prescribed manner, but became a series of structures to be transformed through their contextual relationships with each other.

Another significant investigation of type comes from Amos Rapoport, who studied the house types of "primitive" cultures in his *House Form and Culture,* published in 1969. The house in particular was chosen because it provides the clearest connection between form and life patterns.[8] Rapoport's study reflects his understanding that

> there is a link between behavior and form in two senses: first, in the sense that an understanding of behavior patterns, including desires, motivations, and feelings, is essential to the understanding of built form, since built form is the physical embodiment of these patterns; and second, in the sense that forms, once built, affect behavior and the way of life.[9]

Rapoport's investigation remains a primary source for comprehending the relationship between the built environment and the people who live in it. Rapoport's approach is extremely significant when studying or designing with a specific culture in mind.

At the same time, the study of typology was particularly strong in Italy, where it has continued to be a focus of discourse. Aldo Rossi's *The Architecture of the City* remains a much-studied treatise on type. Like Rapoport, Rossi also recognizes the multi-layered nature of typology, as he reminds us that "it reacts dialectically with technique, function, and style, as well as with both the collective character and the individual

---

[7] Moneo, p. 36.

[8] Amos Rapoport, *House Form and Culture.* (Englewood Cliffs, NJ: Prentice-Hall, Inc, 1969), p. 10.

[9] Ibid., p. 16.

moment of the architectural artifact."[10] In addition, just as Rapoport studied the settlement patterns of vernacular housing as well as the house, so Rossi extends the idea of type beyond the single building into city planning. According to Rossi,

> the *type* developed according to both needs and aspirations to beauty; a particular type was associated with a form and a way of life, although its specific shape varied widely from society to society. The concept of type thus became the basis of architecture, a fact attested to both by practice and by the treatises.[11]

Rossi clearly acknowledges the significance of type and suggests that it has proven itself over time. In addition, Rossi raises the issue of typology as a duality of necessity and beauty, which is a fundamental part of architecture.

In his article "Unearthing the Type," Augusto Romano Burelli also describes dual means of pursuing the notion of type:

> This kind of abstraction calls for both training and inspiration: the intellect reflecting upon the type is combining an exercise in logic with an exercise in evocation. ... The didactic aspect of this study of types has nothing codified or incontrovertible about it; it is a mental exercise, just as the measurement of the units of signs is more rhetorical than a system of rules.[12]

Burelli describes type as "a form of the spiritual life of architecture, an original atavistic model in which future works may recognize themselves."[13] Consequently, the type is elusive, but it provides a common basis for comprehension of the present.

---

[10] Aldo Rossi, *The Architecture of the City*. (Cambridge: The MIT Press, 1982), p. 41.
[11] Ibid., p. 40.
[12] Augusto Romano Burelli, "Unearthing the Type," in *Architectural Design* vol. 55, nos. 5-6 (May-June 1985), p. 48.
[13] Ibid.

This thesis explores typology as the method of understanding the built environment of the Acoma Reservation in New Mexico, with the further goal of proposing new construction that embodies those types. Acoma is an enigmatic place that has developed from a worldview and cultural beliefs that differ radically from the rest of the country. Study of typological generators can reveal a wide array of aspects about the site and the culture, from social organization and religious practice to climate and building technology. Although there must be necessary exclusions from this study, these primary typological factors will be developed through this investigation. The results will offer essential information for designing responsive architecture at Acoma.

Architects are faced with the dilemma of designing buildings for someone other than themselves in almost any project, but the complex cultural system deepens the issue at Acoma. In a recent article, Antonio Monestiroli proposes a way to design in such a complicated world:

> the definition of a method at least helps us to keep track of the vastness and complexity of a discipline in which we work, and to establish that the design of architecture is a process that constitutes the knowledge of men and the places they inhabit, which are shaped according to the historical culture and the intention of representing in an evident and lasting way those values.
>
> The knowledge of the *theme*, the study of the *sites*, the definition of the *types* and of their method of *construction*, the research into form are all steps in a single procedure that entails the awareness that the designer must succeed in being an interpreter of the culture of the collective to whom his design is destined. There is a relatively narrow space for one's own point of view, it is limited to the capacity of

> *translating* into architectural forms the aspirations of the time.[14]

The architect has the opportunity to create a new architectural form that embodies the traditional culture as well as the current time. At Acoma, the architecture should involve the history of the pueblo, the cultural worldview and the physical environment, yet not compromise the present or the future. Cultural beliefs can be evoked in contemporary architecture with the judicious use of both historical and current construction practices. Although the architect is not usually a member of the culture, she can offer the means to translate a spatial concept into built form, especially when faced with a schism between past and present construction technologies. The study of typology provides first step in a process for understanding traditional forms and designing related contemporary spaces.

[14] Antonio Monestiroli, "A Question of Method," in *Domus*, no. 727 (May 1991), p. 28.

> The presence of mountains; the altitude of the very valley itself; the outlying deserts beyond; the effects created by the interchange of influence and response between that particular land and that particular sky – all had effect and expression in the Pueblo world.[15]
>
> - Paul Horgan

Located approximately 50 miles west of Albuquerque, the Acoma Reservation covers an area of approximately 245,672 acres and contains a stark environment of mesas, valleys, arroyos, and rolling hills rising toward Mount Taylor at the northwest end[16] [Figure 1]. The most recognized part of the reservation is the pueblo itself, which is sited on the top of a steep mesa almost 400 feet above the surrounding area [Figure 2]. Acoma Pueblo, known as "Sky City" by the tourists, is imbued with deep significance, but in fact covers much less than 1% of the area of the reservation.

The pueblo occupies 17 acres on the top of a sandstone mesa, located east of the geographic center of the reservation. Three almost parallel rows of houses line the northern portion of the mesa, forming two east-west thoroughfares between the rows. The houses are built contiguously within linear blocks, with the gaps between blocks creating narrow walkways and larger ritual spaces [Figure 3]. Individual house construction and overall organization will be discussed in greater detail in the following chapter.

---

[15] Paul Horgan, "Place, Form and Prayer," in *Landscape Magazine of Human Geography* 3 (Winter 1953-1954, No. 2), p. 7.

[16] Velma Garcia-Mason, "Acoma Pueblo," in *Handbook of North American Indians, Volume 9: The Southwest*, volume edited by Alfonso Ortiz. (Washington DC: Smithsonian, 1979), p. 451-2.

ACOMA MESA
AND PUEBLO
SOUTH MESA
COLORADO
Albuquerque
Santa Fe
Los Alamos
Rio Rancho
Grants
Gallup
Farmington
Espanola
Chimayo
Los Lunas
Belen
Bernalillo
Valencia
Socorro
Taos
Las Vegas
Roswell
Carlsbad
Hobbs
Clovis
Portales
Tucumcari
Ruidoso
Alamogordo
Las Cruces
Deming
Silver City
Lordsburg
Truth or Consequences
Artesia
Lovington
Raton
Santa Rosa
Tucumcari
Gallup
Aztec
Bloomfield
Chama
Dulce
Cuba
Jemez Springs
Jemez Pueblo
Zia Pueblo
Santo Domingo Pueblo
Santa Ana Pueblo
San Felipe Pueblo
Cochiti Pueblo
San Ysidro
Algodones
Bernalillo
Placitas
Sandia Park
Cedar Crest
Tijeras
Edgewood
Moriarty
Estancia
Mountainair
Willard
Torreon
Manzano
Punta de Agua
Isleta
Los Padillos
Pajarito
Armijo
Los Chavez
Peralta
Meadow Lake
Bosque Farms
Adelino
Rio Grande Estates
Jarales
Bosque
Dalies
Toma
Tome
Los Tunos
Escabosa
Cedro
Villago
Golden
Madrid
Cerrillos
Galisteo
Lamy
Santa Fe National Forest
Cibola National Forest
Sandoval
Valencia
Bernalillo
Santa Fe
Los Alamos
San Juan
Rio Arriba
Sandoval
Cibola
Valencia
Torrance
Lincoln
Otero
Eddy
Chaves
Roosevelt
Curry
Quay
Harding
Union
Colfax
Mora
San Miguel
Guadalupe
De Baca
Roosevelt
Lea
Eddy
Otero
Sierra
Dona Ana
Luna
Hidalgo
Grant
Catron
Socorro
Valencia
Cibola
McKinley
San Juan
Rio Arriba
Taos
Colfax
Union
Harding
Quay
Curry
Roosevelt
Lea
Chaves

Figure 2 View of Acoma Pueblo from the valley floor. [Photo by the author, March 2001]

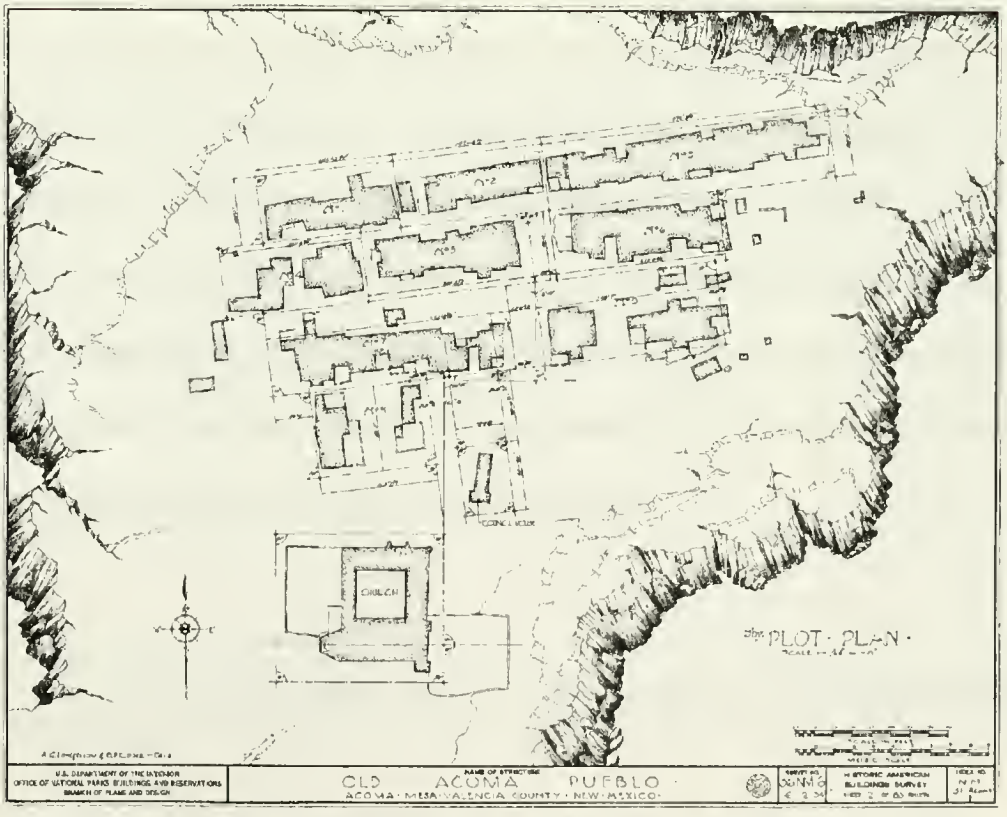


Figure 3 Historic map from HABS survey, 1934. [Library of Congress, Prints and Photographs Division, Historic American Buildings Survey, HABS,NM,31-ACOMP,1-3]

The majority of the reservation is located over 6000 feet above sea level, with Mount Taylor reaching a height of 11,308 feet.[17] A strong visual element from the reservation, Mount Taylor is not only one of the highest points in New Mexico, but also a prominent symbolic place for the people of Acoma, who call it *Kaweshtima* [Figure 4]. The Spanish called the mountain San Mateo, but Lt. James H. Simpson of the U. S. Army's topographical engineers named it Mount Taylor in honor of President Zachary Taylor in 1849.[18]

Mount Taylor is the oldest volcano in the area and was most active between 3.3 million and 2.5 million years ago. There are also basaltic lava flows of more recent date extending over the northern portion of the reservation, which contain sacred sites for the Acoma. The geological formation of the area is significant to its material culture as well, providing pottery clay, obsidian, coal, building stones, lava rock, and limestone.[19]

Another large landform visible from the pueblo is known as *Katzimo*, or the Enchanted Mesa [Figure 5]. It is a sheer-sided mesa that according to many sources was an earlier settlement site for the Acoma, before a great storm destroyed the path to the top, leaving a few of the tribe stranded. Several archaeological expeditions have explored the mesa, finding some evidence of human occupation.[20]

---

[17] Sherry Robinson, *El Malpais, Mt. Taylor, and the Zuni Mountains.* (Albuquerque: University of New Mexico Press, 1994), p. 127.

[18] Ibid., p. 109.

[19] Garcia-Mason, p. 452.

[20] Leslie A. White, "The Acoma Indians," in *Forty-Seventh Annual Report of the Bureau of American Ethnology to the Secretary of the Smithsonian Institution 1929-1930.* (Washington, DC: United States Government Printing Office, 1932), p. 25.

Figure 4 View of Mount Taylor from Acoma Pueblo. [Photo by the author, March 2001]

Figure 5 View of Enchanted Mesa from Acoma Pueblo. [Photo by the author, March 2000]

The reservation as a whole exists in a semi-arid environment with an average of 10 inches of rain per year and temperatures ranging from 103 degrees in August to 20 degrees in December. The reservation land provides 17,000 acres of dry farmland, 2,000 acres of irrigated farmland, and 250,000 acres of open grazing land. At the north end of the reservation, farming in the valley along the San Jose River yields alfalfa, oats, wheat, corn, chili, melon, squash, vegetables, and some fruits including apples, apricots, cherries, peaches, pears, and plums. There are also 3,000 acres of timberland (piñon and juniper on the mesas and lowlands, Ponderosa pine and Douglas fir high on the mountain slopes). Cottonwood, willow and tamarisk are found in the San Jose valley.[21] A single cottonwood grows within the pueblo itself, the only tree on the mesa.

Figure 6 View of the sole tree on the mesa with cistern to the right. [Photo by the author, January 2001]

[21] Garcia-Mason, p. 452.

Historical Overview

The settlement on the mesa at Acoma vies with the Hopi Orayvi Pueblo for the claim of oldest continuously occupied site in the United States. In fact, the elders maintain that the name Acoma signifies a "place that always was."[22] Other sources have translated the name to mean "place of preparedness."[23] The history of the place is long; of necessity, the overview that follows can only cover the essential events. A full account of Acoma history can be found in Ward Alan Minge's *Ácoma: Pueblo in the Sky*.[24]

According to Minge, "archaeologists do agree that old Ácoma was inhabited at least from A. D. 1200 to the present, possibly beginning with the extensive Indian migrations of the thirteenth century."[25] In fact, archaeological evidence from 1952 confirms the remains of pueblo structures that date from A. D. 1075 to 1599.[26] There is also evidence in the material and oral histories to support earlier occupation of sites near the current pueblo. From 1947 to 1954, Alfred E. Dittert, Jr. and Reynold J. Ruppé, Jr. excavated several sites in what they came to define as the Acoma Culture Province. The connection of this surrounding area to the current pueblo in the center is discussed in Ruppé's dissertation, published in 1990.

---

[22] Reynold J. Ruppé, Jr., as cited in Ward Alan Minge, *Àcoma: Pueblo in the Sky*. (Albuquerque: University of New Mexico Press, 1991), p. 1.

[23] Peter Nabokov, *Architecture of Acoma Pueblo*. (Santa Fe: Ancient City Press, 1986), p. 1.

[24] Ward Alan Minge, *Ácoma: Pueblo in the Sky*. (Albuquerque: University of New Mexico Press, 1991).

[25] Minge, p. 1.

[26] Alfred E. Dittert, Jr. and Judy L. Brunson-Hadley, "Identifying Acoma's Past: A Multidisciplinary Approach," in *La Frontera: Papers in Honor of Patrick H. Beckett*. The Archaeological Society of New Mexico Papers 25, p. 66.

In his Bureau of American Ethnology report, Leslie White recounts written descriptions of Acoma Pueblo dating from 1539. The following year, a Spanish expedition recorded finding "a village which was on a rock called Acuco, having a population of about 200 men."[27] In 1581 the first priest to attempt to convert the Acoma, Fray Agustin Rodríguez, arrived at the pueblo.[28] The farming methods of the Acoma were also described at this time, including the use of irrigation from the San Jose River. In general, these early Spanish visitors to Acoma were received in friendship, after initial fear of the outsiders. All this would begin to change at the end of the 16th century.

After being given a contract from Spanish authorities in 1595, Don Juan de Oñate began to colonize New Mexico and "claimed it necessary to force the submission and obedience of the natives."[29] This news made it to Acoma, which may have led to their attack on a Spanish party led by Captain Juan de Zaldívar in 1598. All of the Spanish were killed, with the exception of four men who chose to jump off the edge of the mesa and managed to get away.

Also that year, Don Juan de Oñate took formal possession of New Mexico for Spain. In response to the attack on his troops, he sent 70 men to Acoma to avenge this attack. The battle resulted in the destruction of the pueblo buildings and the deaths of many of the Acoma living in the pueblo. In addition, the remainder of the tribe was severely punished:

> The males who are over twenty-five years of age I sentence to have one foot cut off and to twenty years of personal

[27] George Winship, as quoted in White 1932, p. 23.
[28] Garcia-Mason, p. 456.
[29] Ibid.

> servitude. The males between the ages of twelve and twenty-five I sentence likewise to twenty years of personal servitude. The women over twelve years of age I sentence likewise to twenty years of personal servitude. Two Indians from the province of Moqui (Hopi) who were present at the pueblo of Ácoma and who fought and were apprehended, I sentence to have the right hand cut off and to be set free in order that they may convey to their land the news of this punishment.[30]

Suddenly the reticence and suspicion of the Acoma, even now, is more comprehensible.

The Acoma soon returned to the refuge of the mesa, keeping their isolation as much as possible. In 1629, a new priest arrived at Acoma. Father Juan Ramírez won the respect of the Acoma when, as legend has it, he rescued a young girl who had tumbled from the edge of the mesa upon his arrival. Father Ramírez is credited with leading the Acoma to build the Mission of San Estevan del Rey. This magnificent church still stands tall on the mesa, although it has been subject to several rehabilitation campaigns during the 20th century. In addition, the houses of the pueblo required rebuilding after the devastation of 1598. A dendrochronology study of the vigas in the houses dated the majority of the current pueblo between A. D. 1646-1652.[31] This short period of construction will play a significant role in the analysis of the housing in Chapter 3.

Oppression of the Pueblo people by the Spanish remained a problem however. By 1680, two of the other Pueblo groups in the Southwest, Tesuque and San Juan, had organized the pueblos in the Pueblo Revolt, which lasted until 1892 and has been written

---

[30] Hammond and Rey, as cited in Minge, p. 14.

[31] William J. Robinson, "Tree-Ring Studies of the Pueblo de Acoma," in *Historical Archaeology* 24 (1990), p. 105.

about extensively in many books. During this time, Acoma became a refuge for people from some of the other pueblos because of its defensible position on the mesa. Nonetheless, the Spanish regained control of the pueblos in 1699. The Acoma lived more peacefully in the following centuries, although there were still major changes to occur. After a smallpox epidemic in 1780-1781, the population dropped from 816 in 1810 to 350 in 1850.[32] The population slowly recovered over the second half of the century, reaching 739 by 1900.

The second half of the nineteenth century and the twentieth century brought battles of a different nature. In 1848, New Mexico came under the jurisdiction of the United States with the Treaty of Guadelupe Hidalgo.[33] The Acoma fought to have their Spanish land grant recognized by U.S. law, as well as by the homesteaders and squatters in the area. In addition, there was a disagreement with Laguna Pueblo over their shared boundaries.

Another major change to the landscape came in the form of the railroad. During the 1880s, the railroad came to the southwest, bringing substantial influence from other cultures. The Atchison, Topeka and Santa Fe Railway was built near the farming villages of Acomita and McCarty's on the Acoma reservation. In fact, the names of McCarty's and nearby Grants are derived from the contractors building the line.[34]

Other lifestyle changes came through the education of the pueblo children. The Spanish had left education to the Church, but the United States Indian Agents took an

[32] U.S Census Office, as quoted in Garcia-Mason, p. 458.
[33] Minge, p. 57.
[34] Sherry Robinson, p. 25.

active interest in providing the pueblos with schools and training opportunities. Established in 1879, the first of these was a boarding school in Carlisle, Pennsylvania, which was followed by one closer to the pueblos in Albuquerque. By the end of 1885, the first schoolteacher was sent to Acoma and a school was instituted at McCarty's.[35]

The school was not readily accepted however; less than 13% of school-age children at Acoma were in attendance, even in 1917.[36] This may be due to the fact that the tribe was not without its own education system. The kiva headmen were

> the traditionally recognized professional teachers. Their native school curriculum consisted of lectures on care of human behavior, human spirit, and the human body, ethics, astrology, child psychology, oratory, history, music, and dancing. Theology was not only taught but also practiced as the most crucial substance of existence.[37]

In many ways, the Acoma are still fighting to preserve their culture from the interference of outside cultures.

Cultural Overview

Acoma Pueblo seems to fascinate all who come into contact with it. From the striking landscape in which they live to the evocative structures they have built and the vivid ceremonies they perform, the people at Acoma have been the subject of study since outsiders first encountered them. Several illustrious ethnographers and anthropologists have recorded aspects of Acoma over the years, including Adolph Bandelier, Leslie

[35] Minge, p. 77.
[36] Garcia-Mason, p. 461.
[37] Ibid., p. 460.

White, and Fred Eggan, among others. It is significant to note that almost all of the available information about Acoma has been written by outsiders and can only be accepted as such. This thesis does not intend to further infringe on the privacy of the people of Acoma, but to some degree utilizes previous work, and does not undertake any additional anthropological or ethnographic investigation. Rather, as a preservation and design thesis, the goal is to understand the typology of the housing at Acoma in order to offer design decisions for the future that respond to the place and the people who live there.

A certain amount of background information regarding cultural organization is necessary, as the culture is intricately woven into the built environment of the pueblo. As Fred Eggan reports in *The Social Organization of the Western Pueblos,*

> The pueblo of Acoma is an independent social, political, and ceremonial unit. The village is divided into several matrilineal and exogamous clans... The economic group is the household - apparently of the same type as among the Zuni and Hopi.[38]

As the westernmost of the seven Keresan-speaking pueblos, Acoma has similarities with both the Zuni and Hopi pueblos. This bridging between the Keres language group and the Pueblo cultures further west has created a complicated context at Acoma. The complex interrelationship of cultural beliefs makes a multidisciplinary study, including architecture, archaeology, anthropology, and ethnology, essential to the understanding of the housing typology at Acoma.

---

[38] Fred Eggan, "The Social Organization of Acoma," in *Social Organization of the Western Pueblos*. (Chicago: The University of Chicago Press, 1950), p. 224.

The Acoma Origin Myth provides the basis for most of the cultural organization of the pueblo. The Pueblo people entered the world at Shipap, the place of emergence, located to the north. They passed through four levels before entering this world led by Iatiku, the mother of all tribes. Iatiku remains the most significant presence in Acoma mythology, which can be seen in the strong matrilineal tradition in the pueblo. Iatiku's human representative is the *cacique*, who "is the most important individual in the pueblo, the most honored, and most respected. He is regarded as the father of the people."[39] In addition, the cacique is the father of the very important Kachina cult, whose masked dancers represent the rainmaking spirits.

The cacique is always a member of the Antelope clan, one of fourteen clans currently in existence at Acoma. Outside of the clan systems are several medicine societies, including the Fire society and the Flint society. Unlike the clans which have to do with kinship, the medicine societies operate with regard to the supernatural. The main purpose of the medicine societies is to cure members of the pueblo, as well as purge evil spirits from the pueblo itself. Members of the medicine societies also counsel the cacique and the tribal council. Both the clans and the medicine societies are given their names by Iatiku in the Origin Myth.

The cacique is assisted by the war chiefs, who "do their utmost to preserve the ancient traditions intact; they oppose any imitation of white or Mexican customs and deplore lack of interest in the old ways. The war chiefs constitute one of the most vital

[39] White 1932, p. 41

forces in the pueblo."[40] The war chiefs represent the Twin War Gods, Masewi and Oyoyewi. The war chiefs are appointed for one-year positions and during this time, they and their families continue the tradition of living on the mesa.

One arm of the political system at Acoma does not date to the Origin Myth. After contact with the Spanish, the new position of governor was added. Appointed for a single-year term by the tribal council, the governor functions as the connection between the cacique (and therefore the tribe) and the world outside the pueblo. According to Leslie White, the governor's position serves a dual purpose:

> First, they represent the pueblo in business, political, or religious transactions with the whites and the Mexicans. Secondly, they act as a screen which quite effectively conceals the existence of the cacique, the war chiefs, and the medicine men – the real powers in the village.[41]

Other positions in this arm of authority include two lieutenant governors; the treasurer; the ditch bosses responsible for keeping the irrigation system working; the sheriff and his assistants, the tribal interpreter; and the secretary.

The way the Acoma regard the environment is particularly significant to this thesis. The mythology and religious beliefs of the Acoma define their world, at the very least in a symbolic way. Some of these beliefs are shared with the other Keresan tribes and are described in White's *The World of the Keresan Pueblo Indians*. The Pueblo Indians entered the world in the north and traveled south to White House, where they

[40] Ibid., p. 45.
[41] Ibid., p. 53.

lived for quite awhile. Eventually the people quarreled and left in separate groups to form the pueblos we know today.

The White House was the center of the world and surrounded by the homes of the gods:

> in the northwest corner was the House of Leaves, the home of Tsityostinako, or "Thought Woman"; she could cause things to happen merely by thinking of them. Spider Grandmother lived in the House of Boards in the southwest corner. Turquoise House was in the southeast corner; Butterfly lived there. And in the northeast corner lived Mockingbird Youth in Yatkana House.[42]

The two gods of the east are further identified with the Twin War Gods. These symbolic places remain part of the worldview, although geographic locations are not generally acknowledged outside the tribe.

The four cardinal points also hold great significance. Each of the directions and the zenith and nadir are identified with a color and the house of a god. The colors of the four directions are the same as the four levels the people passed through to enter the world: white is the first level and is associated with the east, red is the second level and the south, blue is the third level and the west, and yellow is the last level and the north. A mountain is symbolically located at each cardinal point as well. The north mountain is perhaps the most important, as it is located in the direction of Shipap. At Acoma, Mount Taylor is located to the north and is a visual representation of this symbol.

---

[42] Leslie A. White, "The World of the Keresan Pueblo Indians," in *Primitive Views of the World.* Stanley Diamond, ed. (New York: Columbia University Press, 1964), p. 87.

In this way, the Acoma people attach spiritual meaning to their material landscape. Edward P. Dozier, a Santa Clara native, discusses the way this occurs in the pueblos of the Tewa language group and possibly others:

> Another common and interesting phenomenon of the Tewa, but perhaps more widely distributed among the Pueblos, is the association of the ecological environment with the socioceremonial organization. Thus, each Tewa village has concentric ecological zones emanating outwards from the center of the pueblo to the peripheries of the Tewa world. Each zone has four shrines located in approximately the cardinal directions, but in prominent physical locations, mounds, hills, cliffs, and the like. First is a zone encircling the pueblo, second, a zone extending to the edge of the cultivated fields, third a zone including the uncultivated plains and foothills, and finally a fourth zone of the encircling mountains. In the last zone are the directional mountains or peaks bounding the Tewa world, each containing a spring and a shrine.[43]

Dozier continues by describing the ordering of the zones by which members of the tribe have authority over them. In his studies of the pueblos, David G. Saile describes three vertical layers in the current world: the earth level on which people live, and the upper level and lower levels where spirits reside.[44] Within these two levels, the spirits dwell in houses in such physical features as clouds, springs, hills, and mountains, which then become places of connection between the spiritual levels and the earth level.[45]

---

[43] Edward P. Dozier, *The Pueblo Indians of North America* (New York: Holt Rinehart and Winston, Inc., 1950), p. 208.

[44] David G. Saile, "Understanding the Development of Pueblo Architecture," in *Pueblo Style and Regional Architecture*, Nicholas C. Markovich et al, eds. (New York: Van Nostrand Reinhold, 1990), p. 59-60.

[45] Ibid., p. 60.

As one might expect, the houses of the people on the earth level must be situated with respect to these powers. This concept recurs in all aspects of Pueblo life. Saile notes that in the pueblos

> any new thing or state had to be made part of the world, 'real,' to 'become.' It also had to be located in its proper place with reference to the powers, directions and structure of the world. Such 'making real' and 'locating' procedures occurred for newborn children, for initiation to a changed religious or social status, for a new pottery jar, for a new house, and for building a whole village on a new site.[46]

At Acoma, the houses were constructed in a consistent manner using available, traditional materials and following rituals established in the Origin Myth and carried out by the cacique and the war chiefs. These spiritual concepts remain a part of the Pueblo building tradition, forming an essential part of the investigation of housing at Acoma.

[46] David G. Saile, *Architecture in the Pueblo World: A Study of the Architectural Contexts of Pueblo Culture in the Late Nineteenth Century*. (Unpublished Ph.D. dissertation, University of Newcastle upon Tyne, 1981), p. 63.

> The pueblo looks like a land form because the close relation of house form and landscape reflects the harmony of man and nature. The whole landscape is sacred, as is the house, and the whole environment influences all of Pueblo life. ... It is this attitude which affects the house, its form, siting, and relation to the land, and helps explain why such buildings enhance rather than damage the landscape.[47]
>
> - Amos Rapoport

The worldview of the Pueblo culture is manifested in the pueblo, from the materials and methods of construction to the way the resulting spaces are used. As Catherine Cameron states, "following Amos Rapoport, it is apparent that not only do pueblos embody cultural ideals and values but the buildings themselves have helped shape the culture of which they are a part."[48] The reciprocity of culture and built environment is a significant factor in considering the design and setting of the housing at Acoma. One must understand the physicality of the buildings to comprehend the culture, which is in turn influenced by the buildings.

Pre-Spanish Pueblo

Although the earliest of its extant buildings date from the early 17th century, the mesa on which Acoma Pueblo is located has been inhabited by the Acoma since at least 1200 A.D. and possibly as early as 1075 A.D. After several successful seasons of

---

[47] Amos Rapoport, 1969a, p. 76.

[48] Catherine Cameron, "Multistory Construction in Southwestern Pueblo Architecture," in *Interpreting Southwestern Diversity: Underlying Principles and* Overarching Patterns, edited by Paul R. Fish and J. Jefferson Reid, eds. Arizona State University Anthropological Research Papers No. 48, p. 195.

excavation in the Cebollita Mesa region of the Acoma Reservation, Reynold J. Ruppé, Jr. and Alfred E. Dittert, Jr. were allowed to investigate an area on the mesa where the current pueblo stands. Their 1951 and 1952 field excavations were conducted in the area east of the church and south of the council house, as shown on the map below.

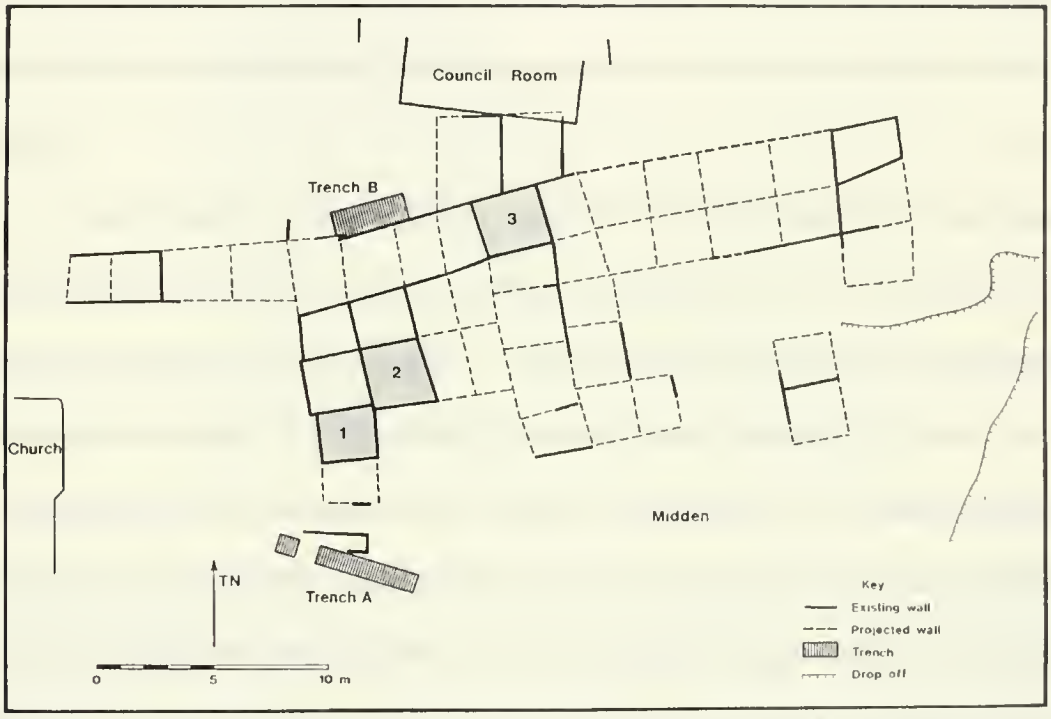


Figure 7 Plan of the Pre-Spanish Pueblo. [Source: Ruppé, *The Acoma Culture Province*]

Three rooms of the earlier pueblo were fully excavated in 1952, with evidence of many more in the area. Some of the walls were difficult to identify, for surface blocks were often removed and reused elsewhere in the pueblo.[49] Through association with pottery and other artifacts, these rooms were found to have been inhabited well before Spanish contact. Discussions with the Acoma suggest that other pre-contact buildings

[49] Reynold J. Ruppé, *The Acoma Culture Province: An Archaeological Concept*. (New York: Garland Publishing, Inc., 1990), p. 215.

had been visible south of the church but were destroyed when the church was rebuilt in 1926. In addition, these conversations revealed that the pueblo was originally located on the south end of the mesa.[50] The church was later built on the site of the original pueblo, which is consistent with the Spanish methods of control at other pueblos during this time. As at Zuni Pueblo, mission churches were often constructed in the center of the pueblo, even within the most significant plaza area, in order to declare the dominance of the church.

Ruppé describes several different methods of building construction that became evident in the archaeological record on the mesa. The earliest walls were built of "linear blocks of sandstone in regular courses. ... The walls had been plastered and painted with red and white pigment."[51] Other slightly later walls were constructed of adobe, or a combination of adobe and sandstone, sometimes of random size and without coursing. In his summary of phases in the Acoma Culture Province, Ruppé describes the architecture of the period between 1200 and 1400 A. D. as comprised of large fortified sites of about 300 rooms, built of masonry with regular coursed walls of sandstone.[52] The excavated rooms on the mesa are oriented in roughly east-west rows, with a depth of up to five rooms.

[50] Ibid.
[51] Ibid., p. 218.
[52] Ibid., p. 245.

17th and 18th centuries

Although the sequence of events after the destruction of the pueblo by the Spanish in 1598 is unclear, tree-ring dating has provided construction dates for the earliest buildings of the extant pueblo. Samples taken from vigas in different house blocks confirm a large number of dates between 1646 and 1652, suggesting that the majority of construction took place within a relatively short time frame.[53] The first floors date almost exclusively from 1646 through 1648, while the second floors begin with dates of 1647 and run through 1652. The remaining third floor vigas reveal an even greater span of time due to later additions or renovations.[54] Furthermore there is a remarkable uniformity about the construction and the resulting spaces that indicates a high degree of coordination between the builders.

These early pueblo buildings were set up in three main east-west rows with circulation space, or streets, between each row [Figure 8]. The houses at Acoma are not built facing the plaza as at Zuni and other pueblos, but all face just east of south. The plaza is a relatively inconspicuous open space in the center of the middle row of houses. Other than the break for the plaza, the houses in each row are mostly contiguous, with only a few places to pass between the buildings to the north or south. One small though significant gap between houses is located at the north end of the plaza, in the northernmost row of houses [Figure 9]. This opening in the row creates a connection from the plaza to Mount Taylor.

[53] William J. Robinson, p. 105.
[54] Ibid., p. 103.

Figure 8 View west between house rows in Acoma Pueblo. [Photo by the author, March 2000]

Figure 9 View north across plaza. [Photo by the author, January 2001]

The plaza is one of the most significant places in the pueblo. The Pueblo worldview dictates that the plaza is the center of the pueblo. Rina Swentzell, an architectural historian from Santa Clara Pueblo, eloquently describes the plaza using the Tewa word *bupingeh* as

> the physical, spiritual, and symbolic center of the Pueblo world. The house structures enclose the bupingeh as the close-by hills surround the Pueblo form and the far mountains contain the Pueblo world. The bupingeh is the space defined by the human-made structures which traditionally were from two to five stories high. Those structures were terraced to replicate the enclosing far mountains. As the mountains described a concavity, or a valley, between them, so did the structures define a safe and nurturing space for human existence from which daily life could be connected to the cosmos.[55]

The plaza is the place where ritual dances are held, with members of the pueblo observing from the nearby rooftops. Even in their street-like alignment at Acoma, the houses serve to surround the plaza, which is especially evident during the religious events held there. J. B. Jackson describes the plaza as "more like a large room designed for some specific group function, a variation on the cell or enclosed space. ... It is a kind of open air room: identified with the religious activities of the house clusters surrounding it."[56] The plaza may physically be a void in the center of the pueblo, but it is one filled with significant meaning and human activity in the Pueblo world.

Furthermore, Catherine Cameron acknowledges in her study of multistoried pueblo construction that the definition of formal plazas coincides with the development

[55] Rina Swentzell, "Bupingeh: The Pueblo Plaza," in *El Palacio* (Winter 1988), p. 15.
[56] Jackson 1953, p. 24.

of the multistory Chacoan Great Houses.[57] Construction opportunities were restricted by the need to preserve the open plaza for religious activities. The top of the mesa had a limited amount of space for building from the start. If an addition to a house near the plaza was needed, one was required to build vertically or move to another less-important location. The linear structure of the pueblo could mean moving quite a distance from the center, possibly serving to restrict the size and organization of pueblo households.[58]

The roofs of the stepped house form served to extend the living space outside of the small rooms. The roofs were used for cooking and drying food, as well as other types of work. The exterior spaces were also a kind of continuation of the plaza, which the community shared:

> the truly communal nature of the dwelling, where even the flat roof is not separated by partitions but is regarded as common ground, like the plaza, reflects the egalitarian society where all individuals are treated alike. Each family has an identical house and there are no palaces, since personal prestige and prerogative are rejected. The importance of the sacred space, the symbolism of orientation and harmonious relation to the land and landscape, all reflect the religious vision of the people. All these features help to explain the form of the Pueblo – not by a one-to-one correspondence but through a fundamental insight into the way of life.[59]

The Pueblo worldview stresses the whole of the community as opposed to the singular family and is indicated in the compact character of the pueblo form. The tribe must work in concert to build the contiguous houses of the pueblo. Any changes to the form

[57] Cameron 1996, p. 198.
[58] Ibid., p. 199.
[59] Amos Rapoport, "The Pueblo and the Hogan," in *Shelter and Society*, Paul Oliver, ed. (London: Barrie and Rockliff: The Cresset Press, 1969), p. 72.

affect the rest of the pueblo, which creates self-regulation of the form by the community as a whole.

As mentioned in Chapter 2, Acoma households are matrilineal. The houses on the mesa at Acoma are passed down through the mother of the family, with additions made to the houses to accommodate expansion through marriage and children.[60] When daughters married, they brought their husbands to live in the house or an addition to the house, and raised their families there. Although the men of the pueblo take care of building and making repairs to the houses, the women are responsible for plastering and regularly replastering their homes.[61] This renewal traditionally took place in August after the late summer rainfall had collected in the cisterns, providing the water needed to make mud plaster.[62]

The construction of the pueblo buildings at Acoma requires rituals that are derived from the Origin Myth. According to the Origin Myth, Iatiku laid out the plan of the town and the plaza and provided a model of a house for the people of Acoma to copy.[63] The preparation of the mesa top and the construction of the houses are again mentioned in the Myth, when the communal nature of the building process is stressed.[64]

The majority of the 17th-century houses at Acoma were four stories including the third-floor rooftop, perhaps relating to the four levels through which the Acoma passed to

---

[60] Eggan, p. 233.
[61] Rapoport 1969b, p. 72.
[62] Peter Nabokov and Robert Easton, *Native American Architecture*. (New York: Oxford University Press, 1989), p. 394.
[63] Matthew Stirling, *Origin Myth of Acoma and Other Records*, Smithsonian Institution Bureau of American Ethnology Bulletin 135, p. 17.
[64] Ibid., pp. 90-91.

gain access to this world.[65] In the Pueblo worldview, the people live in the middle, or earth layer between two spiritual layers. In the typical Acoma house, the people lived on the middle two floors, with storage of significant goods on the first floor and access to the sky from the fourth level on the roof. The living spaces of the houses were not traditionally specialized in use. These front rooms could contain workspace and benches, as well as shrines and places to sleep.[66] In fact, everyday spaces in the pueblo acquire sacred significance at particular times in the ceremonial cycle. This reflects the Pueblo view that the landscape as a whole is significant and holds a place in the spiritual world.[67]

Iatiku also taught the Acoma how to build kivas, including the rituals necessary to give them life. According to the Origin Myth, the first beams of the kiva were made of four different trees that the people climbed on through the four levels of the underworld. Prayer sticks and different colored turquoise relating to the cardinal directions were placed under the foundations to make them strong. Existing pueblo buildings are also renewed through ritual, as evidenced at Acoma when the "war chiefs move from house to house 'to fortify the walls' by pressing bow and flint against the corners."[68] The rituals establish and renew the buildings' place in the pueblo.

These concepts are not apparent to the casual visitor to Acoma however. Much of the sacred culture of the Acoma is difficult for the outsider to recognize. A simplified example of this is the way the kivas at Acoma are tucked into the rows of houses, and are

---

[65] Saile 1981, p. 92.
[66] Ibid., p. 118.
[67] Ibid., p. 116.
[68] Parsons, as cited in David G. Saile, "Making a House in the Pueblo Indian World," in *Architectural Association Quarterly* 9, Nos. 2-3, p. 78.

only demarcated by the double ladders outside. Furthermore, the cacique, or religious leader of the pueblo, is not a public figure, a position that is left to the tribal governor. Like the kivas, the cacique's headquarters is located within a row of houses and is accessed by a double ladder. A rare open space for dancing in front of the cacique's headquarters provides a clue to its significance.

Figure 10 View of cacique's house. [Photo by the author, January 2001]

Some of the most important sites in the pueblo go virtually unnoticed by the general public. The symbolic *shipapu*, or place of emergence, is often only a hole in the ground or a stone left on the surface of the earth in most, if not all, of the pueblos. These simple natural features are overlooked by the many tourists who come to visit the pueblos. The interiors of houses both on the mesa and off contain sacred objects that are also visible, but they are not recognized as such by the uninitiated. According to the Origin Myth of Acoma, the kiva itself is the representation of Shipapu. Undoubtedly

there are many more examples of sacred signs that are not noticed by outsiders, which allows the Acoma to maintain a veil of secrecy over some of the manifestations of their religious beliefs.

Building materials and their use are more readily comprehended by those outside the culture. The materials available in the area dictated the methods of construction and dimensions of the houses on the mesa. The Acoma first used stone, which they procured by "winning" it from the ground, to make the walls. It is likely that adobe block technology was not used until the Spanish contact period. Since the extant pueblo buildings were built after the Spanish came to the mesa, there are examples of both methods of wall construction throughout Acoma, as shown in Figures 11 and 12 on page 37.

During a linguistic study of Acoma grammar in the 1950s, an Acoma man in his fifties named George Garcia described his understanding of how the pueblo was built in the 17th century. Garcia twice mentions during his interview that the rows of houses were built as a single unit and then divided up between the families of the tribe. He describes the way materials for adobe were brought to the mesa, including bark, sticks and ashes.[69] One archaeologist speculates that the adobe blocks used to construct the extant houses on the mesa contain parts of the pre-Spanish pueblo buildings and that in a way, this material has been preserved. According to Michael Marshall,

> these adobe blocks were manufactured almost entirely from midden debris which had accumulated about the margin of the mesa through the early centuries of habitation.

[69] George Garcia, "Building Houses," in *Acoma Grammar and Texts* by Wick R. Miller (Berkeley: University of California Press, 1965), p. 239.

> Enclosed within these adobes are the fragmented artifactual remains of the early continuum.[70]

Conceptually, this fits in well with the Acoma's belief that their material heritage is better left in place rather than removed for further investigation.

Although stone and the materials for adobe were plentiful in the area, trees large enough to be used as vigas had to be brought from Mount Taylor to the north. As Jackson describes pueblo construction methods,

> the materials come from as close at hand as possible; only the beams of pine or juniper or perhaps cottonwood are brought from any distance. Since the width of the room is determined by the length of the roof beams, you will rarely find a room much wider than 14 feet, and a room 12 by 20 is sizable by Pueblo Indian standards. Many rooms in the older prehistoric villages are in fact no more than five feet square.[71]

The roofs were built with vigas spanning from wall to wall in the small Pueblo rooms. The vigas were traditionally used in a north-south orientation, often extending well beyond the exterior wall [Figure 13]. It has been speculated that the vigas were not trimmed at the wall in order to preserve the entire length of the viga.[72] This would allow the viga to be reused to span a larger room at a later date. This may also explain the orientation of the vigas, since the length from east to west would be restricted by the houses on either side. Vigas and carved beams were indeed reused with regularity, as is still evident at Acoma today [Figure 14].

---

[70] Michael P. Marshall, "Acoma Pueblo: An Archaeological Evaluation," unpublished manuscript, p. 6.

[71] Jackson 1953, p. 21.

[72] Rapoport 1969b, p. 69.

Figure 11 Example of oldest stone construction on the mesa. [Photo by the author, March 2000]

Figure 12 Example of oldest adobe block in Acoma Pueblo. [Photo by the author, March 2001]

Figure 13 Historic photo of houseblocks with long viga ends evident, ca. 1883.
[Photograph by Ben Wittick. Courtesy of Museum of New Mexico, Neg. No. 16045]

Figure 14 Example of carved beams found in house.
[Photo by the author, March 2000]

During his study of the tree-rings in the vigas at Acoma, William Robinson documented the system of roofing at Acoma in particular:

> individual rooms at Acoma are roofed with from five to nine vigas. The mode, however, is six. With only two exceptions, pinyon (*Pinus edulis*) and ponderosa (*Pinus ponderosa*) were the species cut for vigas in the early 17th-century construction, with pinyon dominating by better than four to one. The diameter of the vigas was quite small, rarely exceeding 15 cm.[73]

Robinson found no evidence that the vigas had been re-used from earlier buildings. The tree-ring patterns showed that the trees were probably cut during the late summer. The tree-ring study also provides evidence that construction of the houses began with the northernmost row and proceeded by row from north to south. In George Garcia's description of the construction of the pueblo, he states that the buildings were built by the entire community in rows from north to south, in a zigzag sequence. According to Garcia, the northern row was built from east to west, the middle row from west to east, and the southern row from east to west, and "finished at the first dance station."[74] This pattern of construction supports the idea that the construction of the pueblo was a concerted community effort, with the Acoma worldview clearly in mind.

The restriction of room size by the length of the vigas led to the repetition of the room to provide enough space for a family. In fact, J. B. Jackson stresses the importance of the room in pueblo architecture. Jackson states, "the basic structural unit is not the house but the room. It is worth emphasizing that growth consists of an indefinite

[73] William J. Robinson, pp. 101-102.
[74] George Garcia in Wick R. Miller, p. 239.

repetition of this basic unit."[75] Thus the very nature of the pueblo is one of aggregation, even before additions were necessary to accommodate expansion of the population. On his visits to Hopi and Zuni settlements in the late 19th century, Victor Mindeleff developed a sketch of the idealized pueblo showing the way these aggregated rooms were organized [Figure 15]. Building organization at Acoma was much the same when the pueblo was built in the early 17th century.

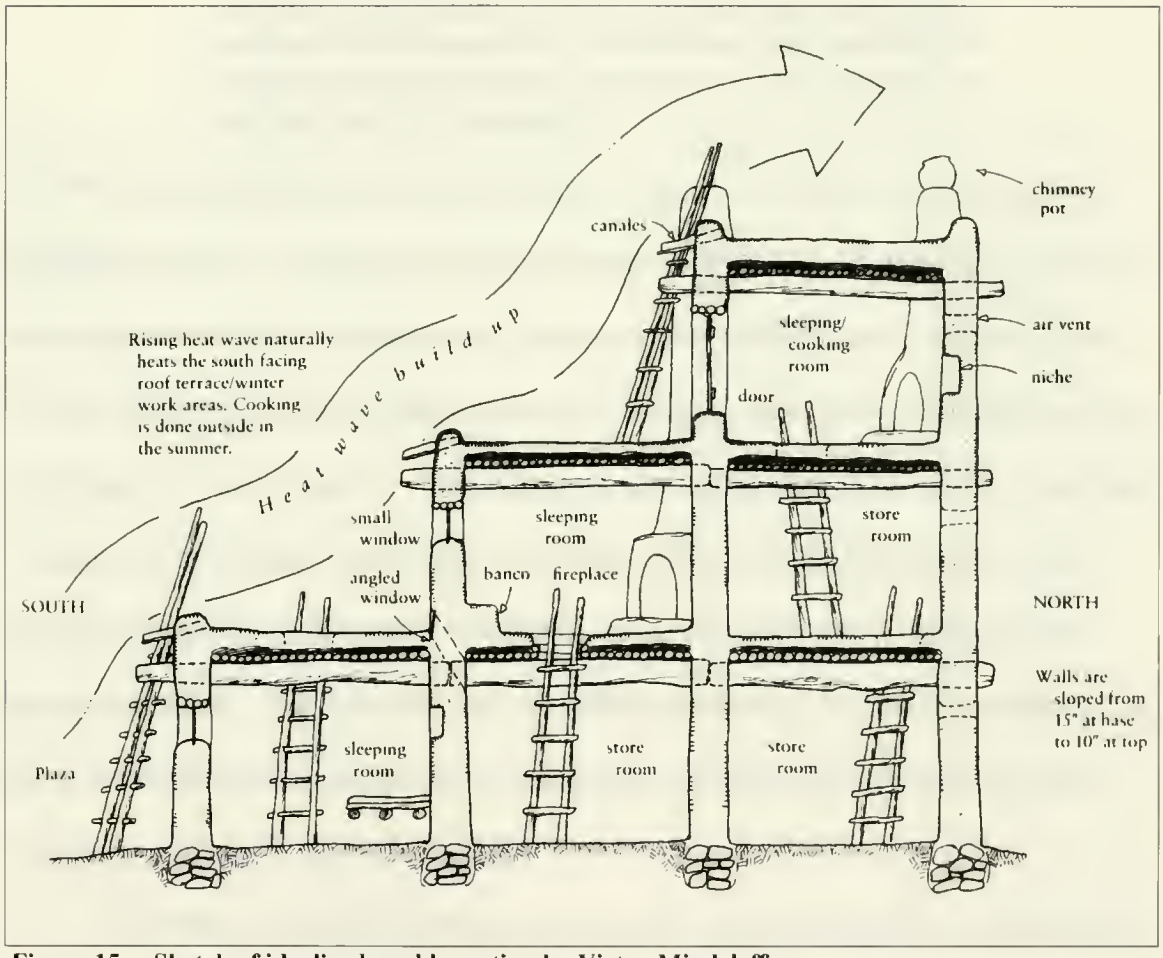


Figure 15 Sketch of idealized pueblo section by Victor Mindeleff [Source: Nabokov and Easton, *Native American Architecture*].

[75] Jackson 1953, p. 24.

As Mindeleff's sketch begins to reveal, the influence of the environmental extremes of the Acoma Reservation extend beyond the availability of construction materials. The building form was shaped by the climate as well, for the materials must be utilized in a manner that mediates the desert-like climate. In his book *Energy and Form*, Ralph Knowles acknowledges this:

> Whatever else men accomplished in the way of defense or trade, enclosure or exposure, their systems must have contended with nature. The clue to this lies in their limits and internal differentiation, in their shape and structure; in short it lies in their form. When nature presses hard, the response must be equivalent.[76]

In 1967-68, Knowles led several studies of the correlation between building form and climatic conditions. Knowles and his students found that the workspaces on the roofs of the first floor rooms were always lit by the sun during daylight hours. The rows were built far enough apart that shadows from the second and third floors in adjacent rows do not shade the exterior spaces. During the summer, the sun is high enough to shine nearly straight down, keeping the doorways in shadow and the interior spaces cool. In the winter, the southern walls gather the warmth of the sun and release it slowly to the interior overnight. The materials for each building system are also well developed. The thick wall construction absorbs more heat then the roof materials do, increasing the equalization of the internal environment.[77]

Futhermore, Adolph Bandelier noted that the Acoma seasonally changed the use of their rooms.[78] Unlike some of the other pueblos, the lower and inner rooms were

---

[76] Ralph Knowles, *Energy and Form* (Cambridge, MA: MIT Press, 1979), p. 18.
[77] Ibid., pp. 30-31.
[78] Adolph Bandelier, as cited in Saile 1981, p. 52.

traditionally used as living spaces in the summer, when these protected spaces would remain cool. The Acoma would move to the upper rooms in the winter, where the heat of the sun would be released from the walls.

In his study of the Acoma Culture Province, Rupert Ruppé also describes the modification of and adaptation to the environment by the Acoma:

> in the case of the Pueblo Indians the alteration of the environment has only been partially complete, but the degree of adaptation to the environment has been much greater. ... The Pueblos were forced to rely on their limited technology and on manipulation of the supernatural by religious means. The technology was able to supply some methods of both altering the environment and successfully adapting to it.[79]

It is interesting to note that Ruppé attributes Acoma's adaptation to the harsh environment to both their own technology and their strong religious beliefs. These beliefs remain a part of the Pueblo culture, even as the availability of technology has increased.

Although the use of thick adobe and stone walls mediates the climate very effectively, it is not the only way that Native Americans have lived in the Southwest. Other groups with varying worldviews have found very different ways of living in the same environment. As compared in a study by Amos Rapoport, the Pueblo Indians and the Navajo have both lived in similar areas, but have developed distinct building forms. While the Pueblo Indians built in dense, connected, orthogonal houses surrounding a plaza, the Navajo constructed individual, round, clustered structures called hogans. Just as the pueblo embodies the worldview of the Pueblo Indians, the hogan responds to the

[79] Ruppé, pp. 18-20.

individual nature of Navajo religion through its construction, use, and siting in the landscape. Thus the differing building forms of the two cultures confirms that building form is affected by more than climate and technology.

Late 19th century into the 20th century

Acoma is an extraordinary example of pueblo architecture and has been the subject of many studies. Acoma Pueblo has been photographed extensively over the years. These photographs provide incomparable insight into the changes that occurred in the form of the pueblo since the late 19th century. Adolph Bandelier stopped at Acoma during his travels through the Southwest in the late 19th century. During the early 20th century, Leslie White investigated life at Acoma by posing as a pottery collector. His study culminated in an extensive report to the Bureau of American Ethnology in 1932. The Historic American Building Survey (HABS) documented all of the buildings on the mesa in 1934, a task that took 29 men almost three months to complete 83 sheets.[80] By the time of the HABS survey, the east-west streets had begun to be infilled and new construction had begun around the perimeter of the early pueblo rows. The buildings were also beginning to show signs of contact with Americans.

At the end of the 19th century, the extension of the railroads through the Southwest brought new building materials to the pueblo including frame doors, windows, and commercial colors on trim.[81] Furthermore, changes to the architecture of the pueblo had a reciprocal impact on lifestyle as well. The first floor of the pueblo building had

[80] Nabokov, p. 7.
[81] Nabokov and Easton, p. 379.

been primarily designed for safe storage of food and other items, without access from the ground level. This use negated the need to introduce light and circulation into these spaces. The new entrances from the street made the first floor appealing as the primary living space [Figure 16]. Now, doors lead into a "great room," where the family can gather and host visitors on specific feast days. The change in use necessitated the addition of windows as well, to achieve needed light and air circulation. Many of these changes are documented in the HABS drawings completed in 1934 [Figures 17 and 18].

Figure 16 Example of entrances and windows added on the ground floor with cistern in foreground. [Photo by the author, January 2001]

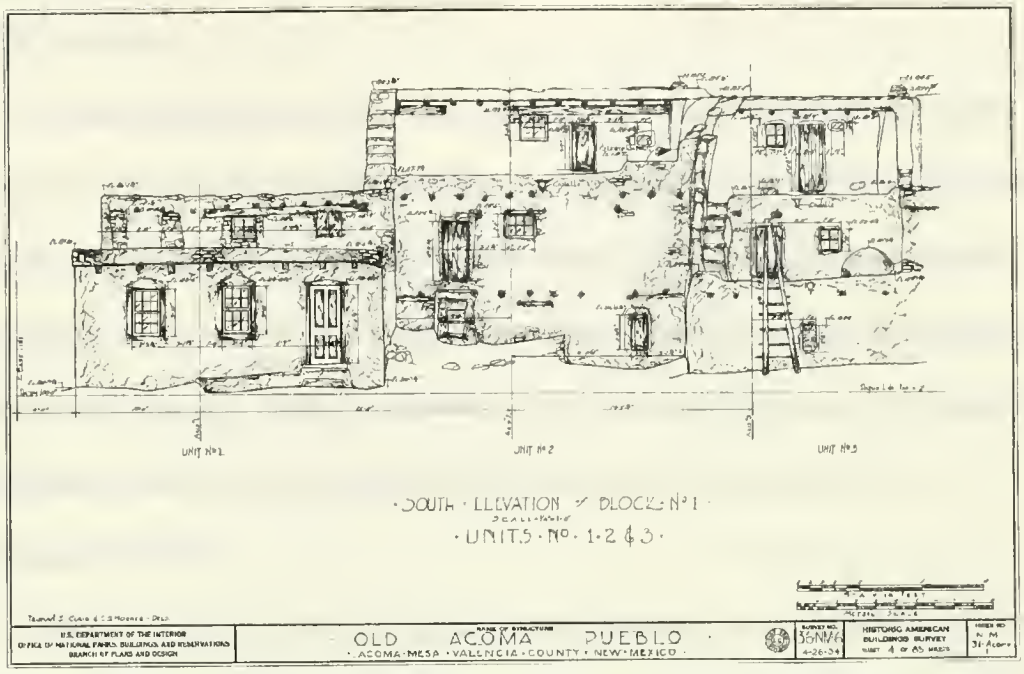


Figure 17 Elevation drawing from HABS survey, 1934. [Library of Congress, Prints and Photographs Division, Historic American Buildings Survey, HABS,NM,31-ACOMP,1-6]

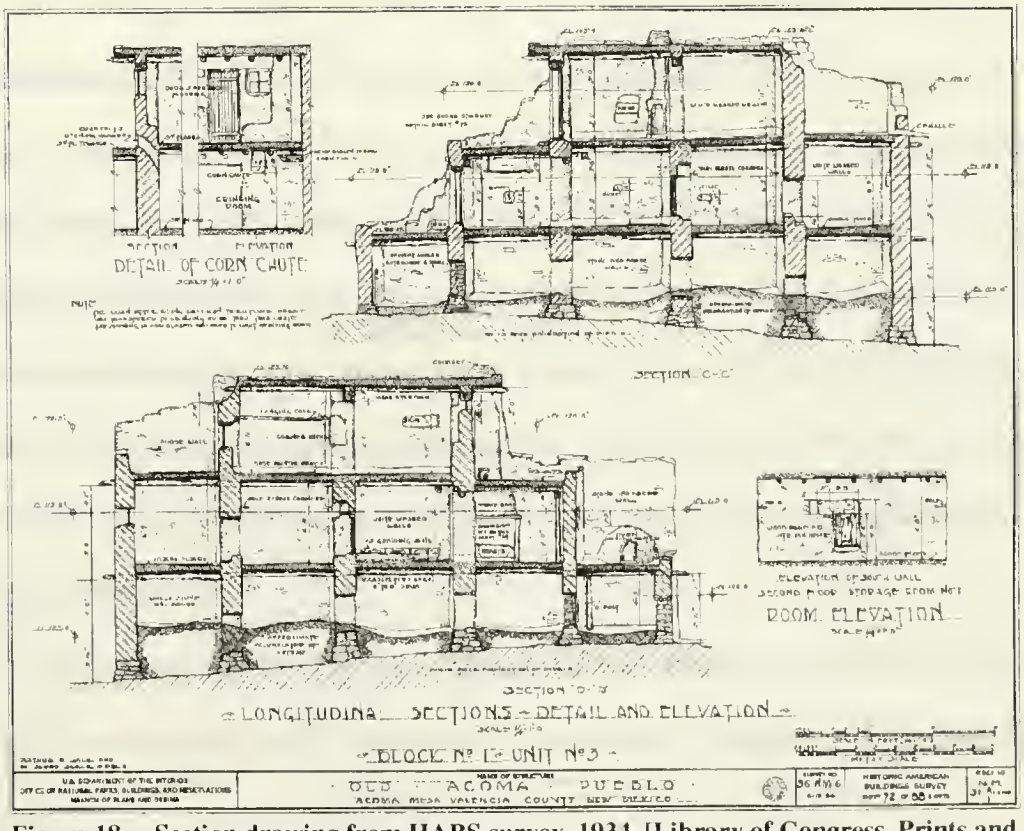


Figure 18 Section drawing from HABS survey, 1934. [Library of Congress, Prints and Photographs Division, Historic American Buildings Survey, HABS,NM,31-ACOMP,1-77]

Late 20th century

Archaeological studies have been conducted on the mesa during the late 20th century as well. In 1986, the Acoma undertook a program to train one of their own to conduct archaeological investigations on their land. Curtis Schaafsma, then the New Mexico State Archaeologist, was brought in to train William Sarracino. According to Schaafsma, the program began in response to insensitive rehabilitation work being done on the historic houses on the mesa by the Department of Housing and Urban Development (HUD).

During the training session, Schaafsma and Sarracino were able to locate walls that were evident in the HABS drawings, but were later taken down. They also uncovered striking evidence of the societal relationship between houses on the mesa. Schaafsma and Sarracino excavated the base of what appeared to be a bearing wall running north-south through the house, but the base of the wall was not found to connect with the floor at all.[82] The owner explained that in the late 1960s or early 1970s, the neighbor on the other side of the wall had demanded that they build their own wall. They were not to share the common wall between the two houses. The new wall is just for appearances, as it does not have bearing capacity. Although Acoma Pueblo may have been built through the efforts of a coordinated community, this event reveals major changes in lifestyle.

Also around this time, the New Mexico Historic Preservation Division (NM HPD) required that an architect with experience in preservation be brought in to monitor the

[82] Curtis F. Schaafsma, Unpublished field journal 1986, p. 6.

rehabilitation work. Paul Graham McHenry, Jr. was selected to be an advisor to the tribe on preservation philosophy and adobe technology. McHenry and his firm documented each house in one houseblock on the mesa, creating a "workbook" of information about the rehabilitation. Each house was photographed and sketched, with notations made of the proposed work to be done on the building. The project also included an analysis of details in historic photographs and diagrams of standard repairs that were common to several buildings.[83] One of the largest issues that arose was the concern of the Acoma about being told what to do with their private property. The rehabilitation project was funded by the federal government, giving them the right to review the work. However, it is important not to alienate the individual homeowners that the project is intended to benefit. In a case like this, the support of the tribe is crucial to the success of the rehabilitation.

Development of Acoma Pueblo has continued into the present. New houses have been built outside of the three original rows, predominantly in the open space to the south and east [Figure 19]. Additions and alterations with modern construction materials persist, sometimes with harmful effects to the original construction [Figure 20]. Major alterations of the living spaces themselves have been relatively limited during the 20th century however. Because the majority of the tribe now live "down below" in or near the centers at Acomita and McCarty's, there has not been an significant attempt to modernize the houses on the mesa.

---

[83] Paul G. MeHenry, Jr. AIA, "Acoma: A Case Study in Preservation Philosophy and Implementation," in *6th International Conference on the Conservation of Earthen Architecture: Adobe 90 Preprints*, (Los Angeles: Getty Conservation Institute, 1990), p. 163.

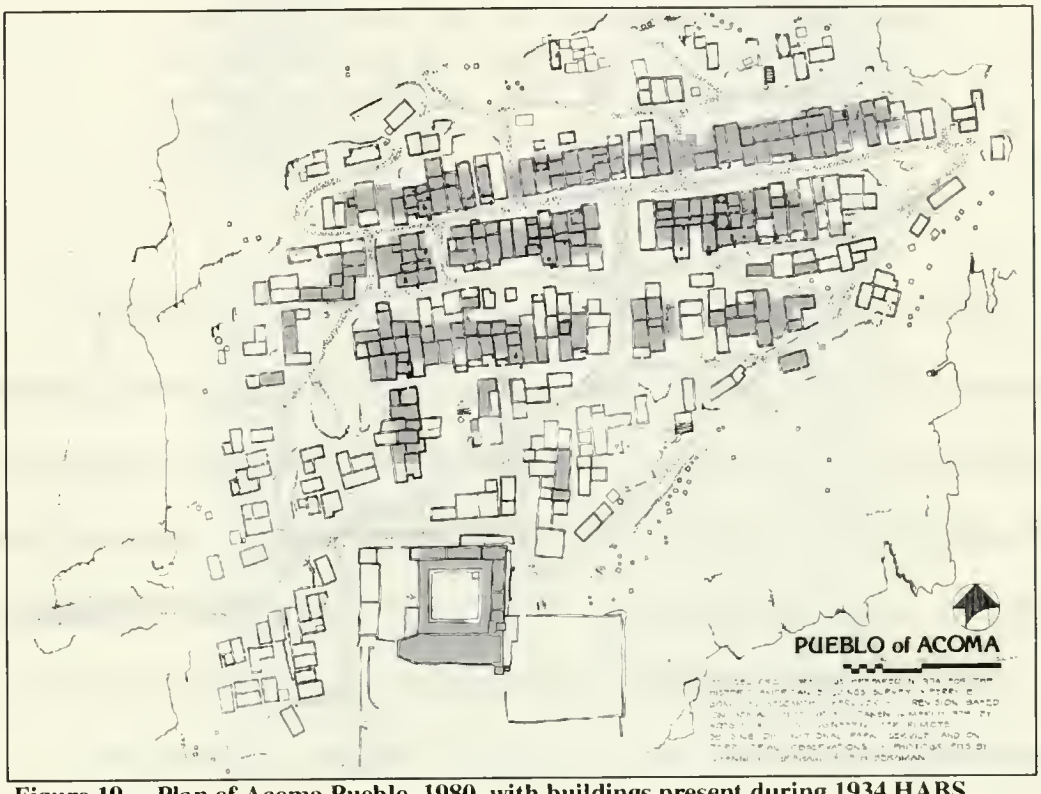


Figure 19 Plan of Acoma Pueblo, 1980, with buildings present during 1934 HABS survey shaded by the author. [Source: NM HPD files]

Figure 20 Examples of alterations to houses on the mesa. [Photo by the author, March 2000]

Chapter 4 Comparative analysis with contemporary house types

> Forty or fifty years ago there were only a few small houses at Acomita, and these were but temporary shelters for workers in the fields. With the passing of danger, the dwellings were built larger and families came down from old Acoma to live.[84]
>
> - Leslie White

Pueblo culture involves the physical world to a degree not found in typical American settlements, as evidenced by the previous chapters. Features in the landscape have ritualistic meaning and the houses are built to express religious beliefs about siting in this landscape. The building materials come from the earth, and the buildings become an extension of the land itself. The orientation and design of the houses on the mesa at Acoma also respond to the climate, mediating the diurnal swings of temperature.

Even with these exemplary features, life on the mesa has always been a challenge. Water is still collected in natural cisterns, and electricity is even now available only by individual generators. By the 20th century, most of the Acoma had moved off the mesa permanently in order to enjoy the benefit of modern conveniences.

The initial settlements off the mesa were simple field houses to provide shelter for Acoma farmers near their crops [Figure 21]. The structures were used seasonally during the growing season, but later became more permanent. As early as 1700, the houses were numerous enough to be divided into two village groups by the Spanish missionaries. These two villages became known as Acomita (named by the Spanish) and McCarty's (later named by the Atchison, Topeka, and Santa Fe Railway). In addition, there are 16

---

[84] White 1932, p. 29.

Figure 21 Photo of field house in Acomita, ca. 1883. [Photograph by Ben Wittick. Courtesy of Museum of New Mexico, Neg. No. 16175]

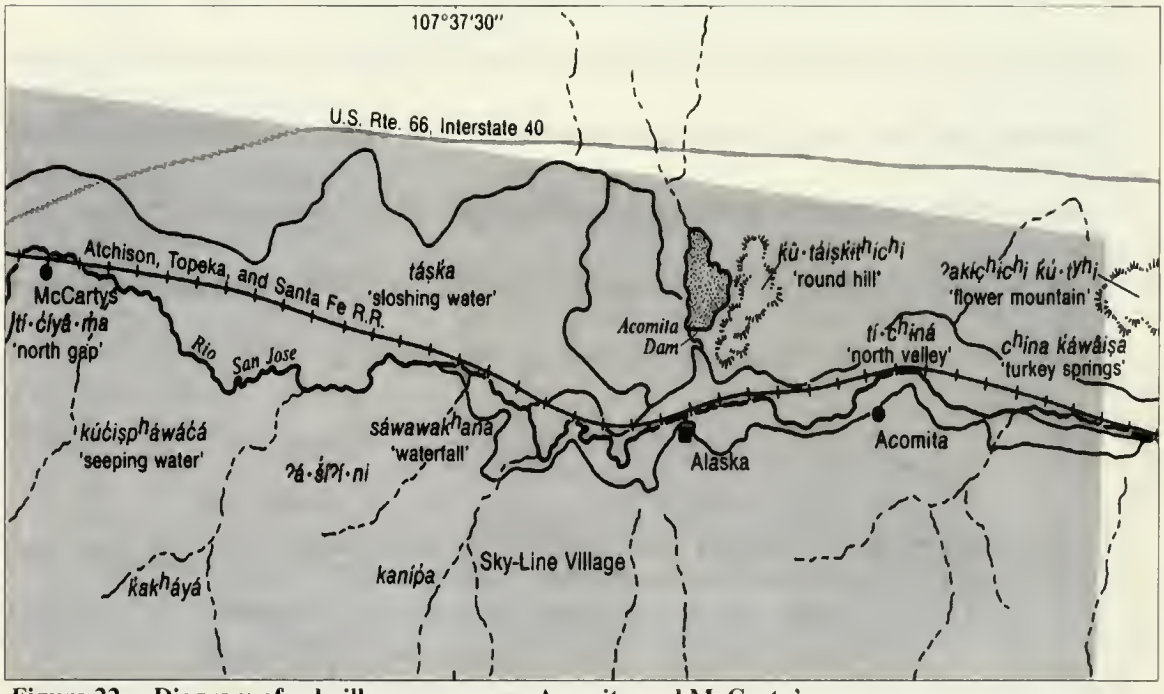


Figure 22 Diagram of subvillage areas near Acomita and McCarty's. [Source: Garcia-Mason, "Acoma Pueblo"]

subvillage areas recognized by the Acoma along the San Jose river, near Acomita and McCarty's[85] [Figure 22]. The points that define these areas carry names that describe each place, thereby establishing a connection to the land surrounding the pueblo.

The early houses in the valley were initially built in a similar manner to the ones on the mesa, although substantial differences soon developed. At the start, the building materials remained the same, and the placement of the houses also recalled the location of the houses on the mesa. In the early 20th century, Leslie White observed that

> at first the houses at Acomita were built high up on the side of a steep mesa, partly from habit and partly from fear. These old houses are still used; people climb laboriously up and down the mesa with burdens of water, provisions, etc., when they could live on the level below if they wished. At times their conservatism seems to be organic, below the level of thought entirely.[86]

Some of these houses appear to still be in use and others are evident in ruins. The houses that made up the early villages of Acomita and McCarty's are spread along the San Jose River and tend to be clustered near the protection of small mesas. The earliest houses may have been connected to one another like the houses in the pueblo; however the majority of the extant houses are discrete structures that rarely connect to the other houses near them [Figures 23 and 24]. As Saile describes, the houses in the Pueblo farming villages

> formed no compact group, there were no kivas (with the exception of Laguna villages), and no dance plazas were defined. The dwellings and spaces of these villages were appropriate settings for individual prayer and ritual but inappropriate for collective ritual and major ceremonial.[87]

[85] Garcia-Mason, p. 450.
[86] Ibid.
[87] Saile 1981, p. 113.

Figure 23 Photo of houses in Acomita in 1907. [Source: Minge, *Ácoma: Pueblo in the Sky*]

Figure 24 Photo of current houses in Acomita. [Photo by the author, January 2001]

This is not surprising, since the valley was settled as a place of work and not of ceremony, or even permanent dwelling. The settlement of the farming villages followed the cultivation of the fields, which by its nature served to separate the houses to some degree. The large open spaces of the valley also allowed the community to spread out in a way that was not available on the mesa.

In his study of the social organization in the pueblos, Fred Eggan notes that the lifestyle of the Pueblo Indians was altered as a result of this change in the pattern of living. Eggan suggested in 1950 that the movement to living year-round in the farming villages "is bringing about changes in the social organization which may be noted in several institutions. There is psychological disintegration taking place; the pueblo is tending to break up into family groups."[88] The loss of shared spaces in the daily life of the community threatened the bonds that exist outside of the basic family group.

The houses themselves have also undergone a drastic change from the historic type on the mesa. As mentioned earlier, even the first houses in the valley were no longer integrated with each other and tended to be only a single story. A native of Santa Clara Pueblo, Rina Swentzell explains the shift away from "multistoried structures in modern Pueblo architecture as a response to the increasing individualism introduced by Euroamerican culture."[89] This individualism is possibly also manifested in a currently voiced desire for the homes at Acomita to remain spread out, even as the Acoma struggle to remain a strong tribal community. In addition, it has been suggested "that in a society where people expect not to have privacy, the construction of solid housing or the

[88] Eggan, p. 224.
[89] Cameron 1996, p. 198.

separation of residences would increase suspicion and hostilities."[90] The cultural shift toward individualism is indicated in the built form, which in turn strengthens the concept of individuality in a formerly communal society.

The majority of the current generation growing up on the reservation has always lived in the valley, a fact that has changed their relationship to the land and the built environment significantly. For most, daily life has been separated from the sacred center of the world. Although the idea of community and the center remains important conceptually, the recent built forms on the reservation do not reflect these beliefs. This is particularly evident in the housing provided by HUD during the late 20th century. In these developments, typical suburban patterns were imposed on the site without regard for the cultural or natural environment in which they were being placed [Figure 25]. These houses set in close proximity resemble neither the contiguous houses on the mesa nor the staggered dwellings of the valley. Furthermore, although the semi-arid climate of the area necessitates a reverence for water, the arrangement of the developments has not taken the need for water conservation into account. The result has been that the tribe has lost precious opportunities for water collection and irrigation in the process.

Although the recent pattern of development has strayed from the Pueblo ideal, there has been an effort to maintain a sense of community on the reservation. Many of the community buildings that have been built in the late 20th century have been centered in one area of the reservation. The Acoma

> share a common government housed in a single tribal administrative office, one Bureau of Indian Affairs

[90] Thomas Gregor, as cited in Denise L. Lawrence and Setha M. Lowe, "The Built Environment and Spatial Form," *Annual Review of Anthropology* 19, p. 479.

> elementary-junior high school (since 1975), a U.S. post office (since 1977), a cooperative food store, a community recreation facility, and a community library. All these are centrally located to encourage the preservation of a single reservation community.[91]

The majority of these buildings are situated near the original village of Acomita, and just northwest of the modern Sky-Line Village development, a HUD project from the 1970s. This congregation of community buildings provides a focus for the daily activities of the tribe, the majority of which now occurs in the valley.

Figure 25 Aerial view of Acomita, with Sky-Line Village on the right and community buildings visible in the upper left. [Source: USGS Aerial Photograph, 1997]

[91] Garcia-Mason, p. 450.

Figure 26 Example of house in Sky-Line Village. [Photo by the author, March 2001]

Figure 27 Example of house in Sky-Line Village. [Photo by the author, March 2001]

The early houses in the valley were built using the traditional materials and techniques developed on the mesa, without the intervention of an architect. Although individual houses are still sometimes built with these methods, the majority of construction that takes place in the valley today is designed by outside professionals without sufficient guidance from the tribe. This begins to explain the lack of correlation between the recent construction on the reservation and the environment in which they have been placed.

In particular, the frame and stucco houses that make up Sky-Line Village are not sustainable in the environment of the reservation [Figures 26 and 27]. All of the materials must be brought from a distance and erected on site. Sometimes the houses are brought to the reservation fully constructed and simply placed on the landscape. Mobile homes can also be found on the reservation, with at least one notable example being encased in adobe to provide better insulation. The less substantial house construction may also have led to the further separation of the houses, as the privacy of each household may be seen to decrease with the thinner walls.

In contrast, building with earth has proven to be an extremely effective method of sustainable design in the semi-arid climate of New Mexico. The thermal mass of the adobe walls mitigates the drastic diurnal swings in temperature without additional mechanical systems. Many of the Acoma are interested in revitalizing these building traditions, hoping that through building projects that incorporate traditional building materials and planning, the local knowledge and religious beliefs of the tribe can be passed down to another generation.

The architect has the ability to facilitate the translation of spatial concepts into built form, and can learn important lessons from the vernacular forms that have developed at Acoma. In turn, the Acoma can see their cultural beliefs and traditional building techniques incorporated into modern construction, rather than simply accepting housing that meets only the most general needs. Through the sharing of knowledge, both the work of the architect and the environment of the Acoma can become richer.

> Architecture, however – the world of objects created by architecture – is not only *described* by types, it is also *produced* through them. If this notion can be accepted, it can be understood by why and how the architect identifies his work with a precise type. He is initially trapped by the type because it is the way he knows. Later he can act on it; he can destroy it; transform it; respect it. But he starts from the type.[92]
>
> - Rafael Moneo

The landscape of the Acoma Reservation is impressive, as the mesa rises dramatically from the middle of the valley floor. The location of the Pueblo has an immediate impact on the visitor, but more importantly it continues to be compelling as more about its physical, social, and metaphorical history is realized. The real power of the place is the embodiment of the culture as a whole within the pueblo. The re-integration of this concept into any future building projects at Acoma is paramount. To create meaningful new spaces at Acoma, the architect must incorporate the cultural beliefs, physical environment, and appropriate building technology both new and old.

The Pueblo worldview, as summarized in Chapter 2, is embodied in all aspects of the built environment. In turn, the structure of the pueblo communicated these beliefs to its residents. The center of Acoma has been established for many centuries in the pueblo on the mesa, yet this is no longer the primary dwelling place for the tribe. The religious center of the Pueblo will never change, but the new settlements down below would benefit from a secular center to begin to rebuild a scattered community. Spatial concepts

[92] Moneo, p. 23.

learned from the pueblo would support that effort, including the idea that space exists in concentric rings and vertical layers, and relates to the cardinal points. The pueblo also establishes the significance of open communal space such as the plaza. In terms of the house itself, distinctive aggregated forms developed as the pueblo houses grew over time.

One of the main tenets of the Pueblo worldview concerns the ordering of space in concentric rings. The pueblo with its central plaza is located at the center of the world with successive rings of defined space around it. As J. B. Jackson asserts,

> it concerns the manner in which the Pueblo Indians seek to organize space. Simply stated, they protect a valued object by surrounding it as many times as possible; the content, whatever it may be, is safeguarded by being placed in a whole series of concentric circles or walls.[93]

Originally, the valued object was the plaza in the center of the pueblo. With the move into the valley, the pueblo itself has become the place to be protected. The relatively recent construction efforts at Acomita fall within one of the conceptual concentric bands centered on the pueblo, but can also begin to assume a central role in daily life on the reservation. In particular, the congregation of community buildings near Acomita marks a site with a central focus that can be further developed.

Design of the open spaces in and around the current and future buildings in this area is one way to establish a sense of community in the valley. View sheds can be maintained that relate to the spiritual points of the Acoma landscape, especially Mount Taylor to the north. Connections between the community buildings can be developed at a human scale that encourages pedestrian use of the area. Although not part of the

[93] Jackson 1953, p. 24.

typology of the housing on the mesa, the use of vegetation can serve to mark the wide open space of the valley in much the same manner as the houses shape the restricted space of the mesa. Careful placement of all future buildings in conjunction with proper land grading can serve to promote the growth of trees and other vegetation along paths and in gardens. Public as well as private outdoor space can be delineated through vegetation, coyote fences, and low solid walls. These features can also be used to mitigate the high winds in the valley.

Cars and trucks have become a severe intrusion in the landscape of the reservation. The ground in the valley is easily damaged, making a logical plan for roads essential. Even walking paths can scar the fragile landscape, but even more harmful are the tracks of trucks that cut into the land when the roads are not planned well. One can learn much about the nature of transportation at Acoma from the marks left on the land. Where possible, placement of the roads should respond to the natural use of the site.

The arrangement of the houses should not be controlled by the need to accommodate the car however. The orientation of the houses should continue to be determined by the cosmological beliefs of the Acoma as well as the climate of the area, as described in Chapter 3. For instance, the buildings need not be lined up in a straight line along an artificial road that has been imposed on the landscape. Instead, the houses should be oriented to allow for the best use of the place, including relationships to the path of the sun, the drainage and collection of water, and the surrounding houses and landscape.

The houses on the mesa as well as the early houses in the farming villages were built for family and clan groups. Family in the pueblo often meant a much larger group than the typical nuclear family, however. The small rooms of the pueblo house were aggregated, leading directly into one another in such a way as to allow additions to be attached easily when the family grew. This concept even found its way to the valley floor, as some of the houses in Acomita exhibit projecting stones at the corner to tie into future additions to the house. The spatial configuration of the houses, as well as their arrangement in the valley should reflect these aspects of Pueblo life.

Traditionally, the houses on the mesa have been made of sandstone and adobe coated in mud plaster. These materials require regular maintenance, which was incorporated as a ritual into the Pueblo religion. According to Rina Swentzell of Santa Clara Pueblo, the buildings of the pueblo are living things:

> we built them, tasted them, talked with them, climbed on them, lived with them and watched them die. They, in turn, would either be kind and warm or torment us with "not good" energies which they might embrace. Many different kinds of energies flowed through the structures because they shared in the energies of the people who lived and died within them, or sometimes, they joined the "bad winds" which blew through them. Periodically, cleansing and healing them was, therefore, very important.[94]

Encouraging the use of these traditional materials with their ritual of maintenance helps to continue a way of life, as well as a long tradition of building techniques.

As they have become available, new materials have been incorporated into the architecture at Acoma for more than a century; even the ubiquitous adobe block was

---

[94] Rina Swentzell, "Remembering Tewa Pueblo Houses and Spaces," in *Native Peoples: The Arts and Lifeways*, vol. 3, no. 2 (Winter 1990), p. 11.

probably brought by the Spanish. Some of the newer technologies have not been as kind to the existing building fabric, as the deterioration and failure caused by the addition of concrete and asphalt to the adobe and stone walls systems can attest.

The practice of incorporating new technologies need not be discontinued however. Instead, sympathetic modern materials can be carefully integrated with more traditional methods. Alfonso Ortiz from San Juan Pueblo describes the Pueblo way of life as

> characterized in essence by intensive horticulture, an elaborate ceremonial cycle, and a cohesive social organization – in the villages of adobe and stone that, for the most part, are strung along the Rio Grande and its tributaries like beads upon a crooked string. These villages all blend in with their surroundings so that one never knows one is approaching a Pueblo until one is right upon it. The architecture of the Pueblos is gentle and unobtrusive, as, indeed are the Pueblo peoples' very character, customs, institutions, and art forms. The Pueblo peoples have shown a genius for maintaining that which is most essential to their lives while also receiving, absorbing, and reinvigorating the decaying "vines" – to use the appropriate and evocative Tewa metaphor – of other ways of life. Hence, the Pueblo legacy has been to endure.[95]

Thus the nature of the Pueblo remains, but is not completely closed to outside ideas. Both the new and old traditions can be enriched by bringing the two together. In particular, the joint created by the integration of different materials and construction techniques acts as a physical connection between the past and the present, much as a change of height in the landscape serves as a link between the spirit and human worlds in the pueblo worldview.

---

[95] Alfonso Ortiz, "Introduction" in *Handbook of North American Indians: Southwest* vol. 9, Alfonso Ortiz, vol. ed., (Washington, D.C.: Smithsonian Institution, 1979), p. 3.

New houses on the reservation have the potential to reincorporate some aspects of the Acoma lifestyle that have been overwhelmed by the imposition of outside forces. The Department of Housing and Urban Design provided a typical suburban settlement at Sky-Line Village, as discussed in Chapter 4, and has also funded construction of a similar housing development to the west. In both developments the houses have been designed and laid out in the same manner as they are in housing developments all across the country. One sign of improvement comes from the fact that the new development includes two model houses to be built using traditional adobe techniques. This is meant to show that while the availability of modern housing is essential to the tribe, the houses need not be constructed like any other suburban development in the country.

Acoma occupies a dramatic site with a long cultural history and distinct physical conditions; however, recent housing developments constructed on the Acoma Reservation have not been designed in response to this environment. In fact, the buildings do not appear to relate to any place in particular. Bringing members of the tribe into the design process would provide insight into their cultural worldview, as well as meet the needs of their current lifestyle. In his essay on the type, Antonio Monestiroli describes the relationship between the architect and his clients such that

> between the collective and those who design, there is thus a relationship... The collective entrusts the architect with the task of representing in complete forms a culture that belongs to the collective, which the architect will set up and give back to the collective for recognition.[96]

It is significant that the collective, or the tribe, be able to identify with the housing

[96] Monestiroli, p. 24.

designs. In a place such as Acoma, the new elements must fit comfortably within the centuries-old landscape. This does not mean that the houses must be copies of the 17th-century architecture on the mesa, or be built solely with primitive techniques for their own sake. New housing designs should not only incorporate the worldview and physical environment of the Acoma, but also the present and future of the tribe.

ARCHITECTURE

Crocker, Ed
1999 Earthen Architecture and Incentives at Acoma Pueblo. *CRM* Vol. 22, No. 6.

Crouch, Dana P. and June G. Johnson
2001 *Traditions in Architecture: Africa, America, Asia, and Oceania.* New York: Oxford University Press.

Dunning, Glenna
1988 *Architecture of the Pueblo Indians: an annotated bibliography.* Monticello, IL: Vance Bibliographies.

Helms, Candi
1993 Breaking Tradition: The Federally Built Landscape of the Navajo Nation. *CRM* Vol. 16, No. 5.

Jackson, John Brinckerhoff
1950 The Spanish Pueblo Fallacy. *Southwest Review.* Vol. 35, No. 1 Winter.

1953 Pueblo Architecture and Our Own. *Landscape Magazine of Human Geography* Vol. 3, No. 2.

1994 *A Sense of Time, A Sense of Place.* New Haven: Yale University Press.

1995 In Search of the Proto-Landscape. In *Landscape in America*, edited by George F. Thompson. Austin: University of Texas Press.

Knowles, Ralph L.
1979 *Energy and Form: An Ecological Approach to Urban Growth.* Cambridge: MIT Press.

Markovich, Nicholas C., Wolfgang F. E. Preiser, and Fred G. Sturm, eds.
1990 *Pueblo Style and Regional Architecture.* New York: Van Nostrand Reinhold.

McHenry, Paul G. Jr.
1990 Acoma: A Case Study in Preservation Philosophy and Implementation. In *6th International Conference on the Conservation of Earthen Architecture: Adobe 90 Preprints.* Los Angeles: Getty Conservation Institute.

Mindeleff, Victor
1989 *A Study of Pueblo Architecture in Tusayan and Cibola.* Washington D.C.: Smithsonian Institution Press.

Morrow, Baker H., and V.B. Price, eds.
1997 *Anasazi Architecture and American Design*. Albuquerque: University of New Mexico Press.

Nabokov, Peter
1986 *The Architecture of Acoma Pueblo: The 1934 Historic American Buildings Survey Project*. Santa Fe: Ancient City Press.

Nabokov, Peter and Robert Easton
1989 *Native American Architecture*. New York: Oxford University Press.

Oliver, Paul
1984 Cultural Factors in the Acceptability of Re-Settlement Housing. In *Architecture in Cultural Change: Essays in Built Form and Culture Research*, edited by David G. Saile. Lawrence, KS: Built Form and Culture Studies, School of Architecture and Urban Studies, The University of Kansas.

Pillet, Michel Louis Roger
1980 Pueblo House Design as a Response to the Arid-Zone Climate. In *Housing in Arid Lands: Design and Planning*, edited by Gideon Golany. New York: John Wiley and Sons.

Playdon, Dennis G. and Brian D. Vallo
2000 Restoring Acoma: The Pueblo Revitalization Projects. *CRM* Vol. 23, No. 9.

Rapoport, Amos
1969a *House Form and Culture*. Englewood Cliffs, NJ: Prentice-Hall, Inc.

1969b The Pueblo and the Hogan. In *Shelter and Society*, edited by Paul Oliver. London: Barrie and Rockliff: The Cresset Press.

1984 Culture and Built Form – A Reconsideration. In *Architecture in Cultural Change: Essays in Built Form and Culture Research*, edited by David G. Saile. Lawrence, KS: Built Form and Culture Studies, School of Architecture and Urban Studies, The University of Kansas.

Sanford, Trent Elwood
1950 *The Architecture of the Southwest*. New York: Norton.

Yguado Association
1972 Acoma Indian Pueblo: Initial Housing Study. Work Item 4 (CPA-NM-09-16-1000).

ARCHAEOLOGY, ANTHROPOLOGY, AND ETHNOLOGY

Cameron, Catherine M.
1996 Multistory Construction in Southwestern Pueblo Architecture. In *Interpreting Southwestern Diversity: Underlying Principles and Overarching Patterns*, edited by Paul R. Fish and J. Jefferson Reid. Arizona State University Anthropological Research Papers 48.

1999 *Hopi Dwellings: Architectural Change at Orayvi*. Tucson: The University of Arizona Press.

Dittert, Alfred E. Jr. and Judy L. Brunson-Hadley
1999 Identifying Acoma's Past: A Multidisciplinary Approach. In *La Frontera: Papers in Honor of Patrick H. Beckett*. The Archaeological Society of New Mexico Papers 25.

Dittert, A. E. Jr. and R. J. Ruppé, Jr.
1950 The Archaeology of Cebolleta Mesa: A Preliminary Report. *El Palacio* Vol. 58, No. 4.

Dohm, Karen M.
1992 Architecture and Privacy in Pueblo Housing. *Visual Anthropology*, Vol. 5.

Dozier, Edward P.
1950 *The Pueblo Indians of North America*. New York: Holt Rinehart and Winston, Inc.

Eggan, Fred
1950 The Social Organization of Acoma. In *Social Organization of the Western Pueblos*. Chicago: The University of Chicago Press.

Ferguson, T.J.
1996 *Historic Zuni Architecture and Society: An Archaeological Application of Space Syntax*. Tucson: University of Arizona Press.

Garcia-Mason, Velma
1979 Acoma Pueblo. In *Handbook of North American Indians, Volume 9: The Southwest*, volume edited by Alfonso Ortiz. Washington DC: Smithsonian.

Gilman, Patricia Ann
1983 *Changing Architectural Forms in the Prehistoric Southwest*. Unpublished Ph.D. dissertation. Albuquerque: Department of Anthropology, University of New Mexico.

Horgan, Paul
1953 Place, Form and Prayer: The Prehistoric Human Geography of the Town Indians of the Rio Grande. *Landscape Magazine of Human Geography* Vol. 3, No. 2.

James, H. L.
1988 *Acoma: People of the White Rock.* Atglen, PA: Schiffer Publishing Ltd.

Lawrence, Denise L. and Setha M. Lowe
1990 The Built Environment and Spatial Form. *Annual Review of Anthropology* 19.

Marshall, Michael P.
1979 "Acoma Pueblo: An Archaeological Evaluation." Unpublished manuscript.

Miller, Wick R.
1965 *Acoma Grammar and Texts.* Berkeley: University of California Press.

Minge, Ward Alan
1991 *Acoma: Pueblo in the Sky.* Albuquerque: University of New Mexico Press.

Ortiz, Alfonso
1979 Introduction. In *Handbook of North American Indians, Volume 9: The Southwest.* Washington DC: Smithsonian.

Ortiz, Alfonso, ed.
1972 *New Perspectives on the Pueblos.* Albuquerque: University of New Mexico Press.

Robinson, Sherry
1994 *El Malpais, Mt. Taylor, and the Zuni Mountains.* Albuquerque: University of New Mexico Press.

Robinson, William J.
1990 Tree-Ring Studies of the Pueblo de Acoma. *Historical Archaeology* 24.

Rothschild, Nan A.
1991 Incorporating the Outdoors as Living Space. *Expedition*, Vol. 33, No. 1.

Ruppé, Reynold J.
1990 *The Acoma Culture Province: An Archaeological Concept.* New York: Garland Publishing, Inc.

Ruppé, R. J., Jr. and A. E. Dittert, Jr.
1952 The Archaeology of Cebollota Mesa and Acoma Pueblo: A Preliminary Report Based on Further Investigation. *El Palacio* Vol. 59, No. 7.

1953 Acoma Archaeology: A Preliminary Report of the Final Season in the Cebolleta Mesa Region, New Mexico. *El Palacio* Vol. 60, No. 7.

Saile, David G.
1977 Making a House in the Pueblo Indian World. *Architectural Association Quarterly* 9, Nos. 2-3.

1980 Dwelling in Cultural Contexts: Examples from Arid Environments. In *Desert Housing: Balancing Experience and Technology for Dwelling in Hot Arid Zones*, edited by Kenneth N. Clark and Patricia Paylore. Tucson, AZ: The University of Arizona, Office of Arid Lands Studies.

1981 *Architecture in the Pueblo World: A Study of the Architectural Contexts of Pueblo Culture in the Late Nineteenth Century*. Unpublished Ph.D. dissertation, University of Newcastle upon Tyne.

1985 Many dwellings: Views of a Pueblo World. In *Dwelling, Place, and Environment: Toward a Phenomenology of Person and World*, edited by David Seamon and Robert Mugerauer. Boston: Martinus Nijhoff Publishers.

Schaafsma, Curtis
1986 Unpublished field journal from Acoma Pueblo (LA 112).

2000 Personal communication with the author, August 31.

Scully, Vincent
1972 *Pueblo: Mountain Village Dance.* New York: Viking Press.

Sedgwick, Mrs. William T.
1927 *Acoma, The Sky City: A Study in Pueblo-Indian History and Civilization.* Cambridge: Harvard University Press.

Simmons, Marc
1979 History of the Pueblos since 1821. In *Handbook of North American Indians, Volume 9: The Southwest*, volume edited by Alfonso Ortiz. Washington DC: Smithsonian.

Snead, James E. and Robert W. Preucel
1999 The Ideology of Settlement: Ancestral Keres Landscapes in the Northern Rio Grande. In *Archaeologies of Landscape: Contemporary Perspectives,* edited by Wendy Ashmore and A. Bernard Knapp. Malden, MA: Blackwell Publishers Inc.

Stirling, Matthew
1942 *Origin Myth of Acoma and Other Records*. Smithsonian Institution Bureau of American Ethnology Bulletin 135. Washington, D. C.: United States Government Printing Office.

Stubbs, Stanley A.
1950 *Bird's Eye Views of the Pueblos*. Norman: University of Oklahoma Press.

Swentzell, Rina
1951 Bupingeh: The Pueblo Plaza. *El Palacio* Vol. 94, No. 2.

1990 Remembering Tewa Pueblo Houses and Spaces. *Native Peoples: The Arts and Lifeways*, vol. 3, no. 2.

White, Leslie A.
1932 The Acoma Indians. In *Forty-Seventh Annual Report of the Bureau of American Ethnology to the Secretary of the Smithsonian Institution 1929-1930.* Washington, DC: United States Government Printing Office.

1964 The World of the Keresan Pueblo Indians. In *Primitive Views of the World*, edited by Stanley Diamond. New York: Columbia University Press.

TYPOLOGY AND FORM

Burelli, Augusto Romano
1985 Unearthing the Type. *Architectural Design* 55, Nos. 5-6.

Colquhoun, Alan
1980 The Idea of Type. *Casabella* 44, Nos. 463/464.

1981 *Essays in Architectural Criticism: Modern Architecture and Historical Change.* Cambridge: MIT Press.

Moneo, Rafael
1978 On Typology. *Oppositions* 3.

Monestiroli, Antonio
1991 A Question of Method. *Domus* No. 727, May.

Ornelas, Wendy, AIA
1990 Type, Memory, and Meaningful Form. *OZ* 12.

Rossi, Aldo
1982 *The Architecture of the City.* Cambridge: The MIT Press.

Rykwert, Joseph
1972 *On Adam's House in Paradise.* New York: Museum of Modern Art.

1989 *The Idea of a Town.* Cambridge: MIT Press.

Vidler, Anthony
1977 The Idea of Type: The Transformation of the American Ideal, 1750-1830. *Oppositions* 8.

Younés, Samir
1999 *The True, The Fictive, And The Real: The Historical Dictionary of Architecture of Quatremère de Quincy.* London: Andreas Papadakis Publisher.

Index

Acoma Pueblo, 8, ***9, 10, 12, 14,*** 15, 18, 25, ***29, 37,*** 43, 46, 47, ***48***
Acoma Reservation, 6, 8, 17, 26, 41, 59, 64
Acomita, 17, 47, 49, ***50,*** 51, ***52,*** 53, 55, 60, 62
adobe, 27, 35, 36, 37, 42, 47, 57, 62, 63, 64
Argan, Guilio Carlo, 3

cacique, 20, 21, 24, 34
Cameron, Catherine, 25, 30

Dittert, Jr., Alfred E., 14, 26
Dozier, Edward P., 23
Durand, Jean-Nicolas-Louis, 3

Eggan, Fred, 19, 53
Enchanted Mesa, 11, 12

Garcia, George, 35, 39
governor, 21, 34

HABS, ***10,*** 43, 44, ***45,*** 46, ***48***
HUD, 46, 54, 55

Iatiku, 20, 32, 33
See also Origin Myth

Jackson, J.B., 30, 36, 39, 60

kiva, 18, 33, 34, 51
Knowles, Ralph, 41

Marshall, Michael P., 35
McHenry, Jr., Paul Graham, 47
Mindeleff, Victor, 40, 41
Moneo, Rafael, 1, 4, 59
Monestiroli, Antonio, 6, 7, 64
Mount Taylor, 8, 11, ***12,*** 22, 28, 36, 60

Origin Myth, 20, 21, 24, 32, 33, 34
Ortiz, Alfonso, 63

plaza, 27, 28, 29, 30, 31, 32, 42, 51, 60
Pueblo Revolt, 16

Ramírez, Father Juan, 16
Rapoport, Amos, 4, 25, 42
Rodríguez, Fray Agustin, 15
Rossi, Aldo, 4, 5
Ruppé, Jr., Reynold J., 14, 26, 27, 42

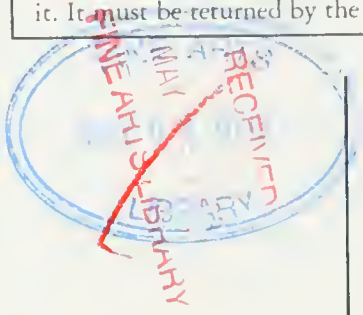
Saile, David G., 23, 24, 51
San Estevan del Rey, 16
Sarracino, William, 46
Schaafsma, Curtis, 46
Shipap, shipapu, 20, 22, 34

Sky-Line Village, 55, ***56,*** 57, 64
Swentzell, Rina, 30, 53, 62

viga, 16, 28, 36, ***38***

war chiefs, 20, 21, 24, 33
White, Leslie, 15, 19, 21, 43, 49, 51

Anne & Jerome Fisher
FINE ARTS LIBRARY
University of Pennsylvania
Please return this book as soon as you have finished with it. It must be returned by the latest date stamped below.



FISHER
FINE ARTS LIBRARY
SEP 12 2001
UNIV. OF PENNA.

3 1198 03280 0257
N/1198/03280/0257X

3 1198 03280 0257
N/1198/03280/0257X